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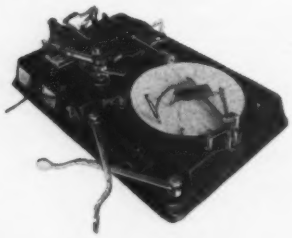

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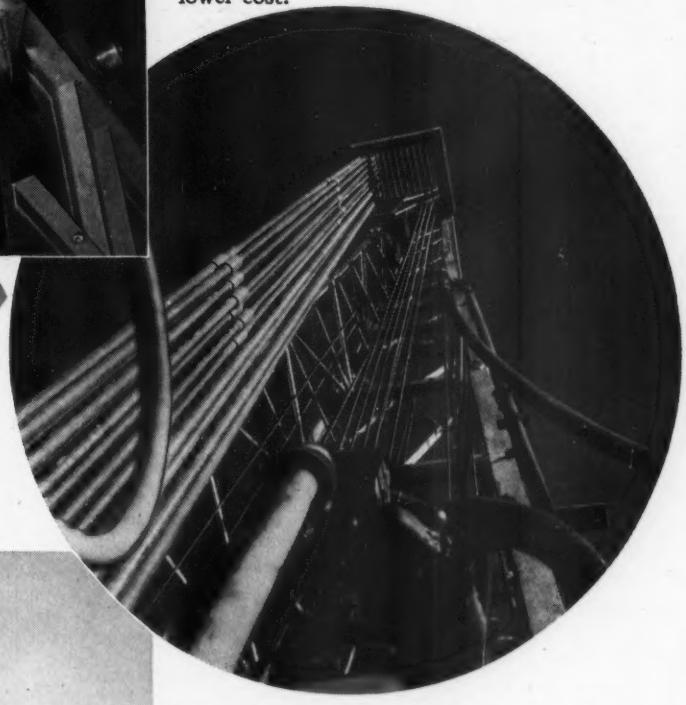

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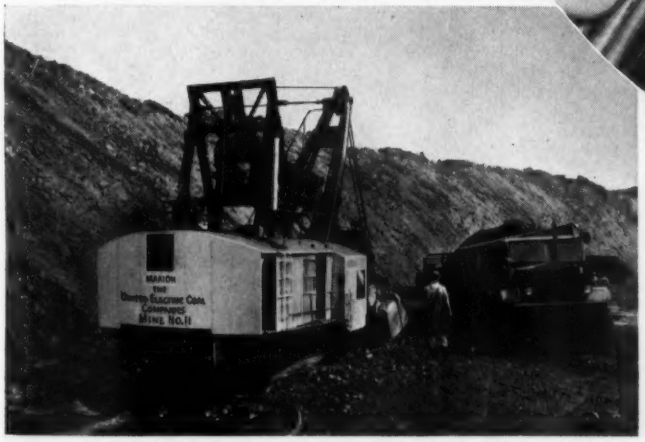

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the OIL AND GAS JOURNAL

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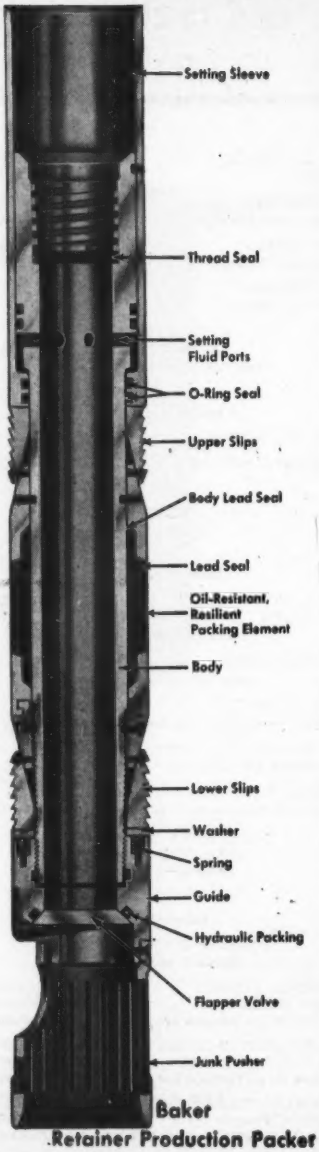

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THE OIL AND GAS JOURNAL

Wherry Committee

NO oil investigation in recent years has gone off on as many tangents as that of the Senate's small-business committee. The only objective of Chairman Wherry and some of the committee membership obviously is to smear the oil business generally, with the hope that it will react to their political advantage. Not a single constructive suggestion has been made which will be helpful to the smaller operating units of the oil industry.

Indicative of the grasp that the committee's chairman has of the basic principles that govern petroleum operations was his request to the President to suspend the Connally Act. This act was originally passed and reenacted to aid the states in ending aggravated cases of conservation violations.

Its suspension or repeal would not end state control but would be an invitation to a few who oppose all conservation regulations, to resume their "hot oil" operations. Thus the senator would accomplish his ends by terminating those controls which are in the interest of all operating units and an essential protection to consumers.

The committee's counsel and certain of the membership also profess to believe that the demand recommendations of the Bureau of Mines, in effect, represent collusion with the state conservation bodies to restrict supplies.

There never has been any obligation on the part of the states to accept the bureau's estimates of demand in determining allowable production. Since state boundaries do not enter into the movement of crude oil from fields to refineries and shipping terminals, the bureau's projections are necessarily based on the previous state divisions of crude markets, taking into consideration the decreases or increases in national requirements.

State allowables have followed the bureau's recommendations when in line with conditions as determined by state conservation units. In actual practice the recommended production of most states has been below or above bureau's recommendations, with total output usually in excess of the national projection.

The value of the bureau's estimates lies in their interpretation of national trends which can be checked against estimates from within the industry and those of state organizations. They are of more protection to consumers than they are to producers. Since the war's end, due to the abnormal increases in consumption, it has been necessary for the bureau to take into consideration the limitations of transportation and refining capacity in arriving at forecasts. There is no evidence of any relationship between the bureau's estimates and price trends for crude oil or products.

After several weeks it is now apparent what the Wherry committee is trying to do. Their actions should not remain unchallenged by the oil industry in its all-out efforts to solve the many problems of constantly expanding demands.

Breakdown of Oil-Industry Steel Needs Outlined in NPC Report

by Bertram F. Linz

WASHINGTON.—The oil and natural-gas industries will require a total of 15,571,500 tons of steel between April 1, 1948, and September 30, 1949, including 1,714,400 tons for foreign operations of American companies, and 951,984 tons of forgings and castings. It was disclosed March 17 by the NPC committee on petroleum industry steel requirements.

The committee's voluminous and detailed report was based on an expected daily demand for 6,250,000 bbl. of oil this year, 6,550,000 bbl. in 1949 and 6,800,000 bbl. in 1950.

Steel requirements for the activities of the domestic industry were placed by the committee at 7,707,900 tons, exclusive of castings and forgings. With another 2,191,900 tons for natural-gas transportation between the gathering system and the city gate. Collateral requirements estimated were 1,496,600 tons for containers, 1,120,400 tons for transportation, and 1,340,300 tons for consumer storage.

Covers All Uses

The figures cover all uses of steel, whether purchased directly from steel mills by operators or furnished indirectly from mills through suppliers, fabricators and manufacturers, and because of the inclusion of many indirect requirements cannot be compared with published statistics on past deliveries of steel to the oil and gas industries, NPC Chairman Walter S. Hallanan pointed out in releasing the report.

The committee, headed by Russell B. Brown of the Independent Petroleum Association of America, broke the requirements down by activities, as follows:

Oil and gas production, 3,654,000 tons; natural gasoline, etc., production 304,600; oil pipe lines, 1,646,400; refining, 1,363,800; terminals, bulk plants and service stations, 611,900; liquefied petroleum gas plant facilities, 127,200; natural-gas pipe lines, 2,191,900; containers, 1,496,600; tankers, 370,900; barges, 319,100; tank cars, 324,300; truck tanks, 106,100; farm and home storage, oil, 558,800; and farm and home storage, liquefied petroleum gases, 781,500.

A production subcommittee report showed that the production steel requirement is based on a program for the drilling of 37,600 wells and 130,500,000 ft. of hole this year and 38,300 wells and 134,000,000 ft. in 1949, and a production of 5,350,000 bbl. daily in 1948 and 5,575,000 next year.

An estimate of probable tanker construction made for the transportation subcommittee by Standard Oil Co. (N.J.), indicated that in terms of T-2 vessels four tankers would be delivered by United States yards this year and 46 in 1949. The scheduled construction abroad calls for 50 tankers this year and 38 next, but in view of delays which are apt to occur it is more likely to be 25 this year and 41 in 1949.

Proposed pipe-line construction during the 18-month period totals 17,219.5 miles, requiring 1,103,655 tons of welded or seamless and 391,628 tons of seamless pipe. The estimate for tank cars is the tonnage required for operation at full capacity of the plants of the two companies which build such cars, and the figure for road transportation covers the production of 4,440 tank trucks of 2,000 gal. or more and 6,000 tank trailers, all sizes. The steel for refining is aimed at securing the 818,000 bbl. daily additional capacity which it is estimated will be required to provide the 6,633,000 bbl. capacity required by the end of 1950, figured on a 90 per cent factor.

For foreign operations, excluding Mexico and Russia, it was estimated American companies would require 727,159 tons of steel for the Western Hemisphere and 996,483 tons for the Eastern Hemisphere.

Seismic Permit Sought For Ohio-Melben Leases

HOUSTON.—An application for permission to conduct seismograph operations on Texas state tracts in the Gulf of Mexico which have been leased to the Benedum interests and Ohio Oil Co. has been made to the Army Engineers office in Galveston.

McCollum Exploration Co., Houston, asked the permit. Operations were proposed in water areas extending into the Gulf a maximum of 16 miles between High Island, Galveston County and a point opposite Gulf, Matagorda County. The seismic work is to be conducted along lines spaced about ½ mile apart, with suspended charges about 1,000 ft. apart.

In the lease sale last November, the Benedum interests took 88 leases totaling 113,280 acres extending in parts as far as 23 miles offshore. Later Ohio Oil Co. purchased a half interest in the acreage from Melben Oil Co., the Benedum firm which originially leased the land.

Another Army Engineers permit asked last week was for work in connection with the sinking of a drilling barge by The Texas Co. in Sabine Lake, Louisiana, about 7 miles east of Port Arthur, Tex. The company said the drilling structures would be removed on completion of the well.

New Turbine-Drilling Method Is Described

WASHINGTON.—Possibilities of a new method of well-drilling, which will be given its first field test in Arkansas late this month, were outlined to a congressional committee last week by Critchell Parsons, of Dallas, president of the Engineering Development Co.

Known as turbine drilling, the new system is most advantageous in the drilling of deep wells, where it offers possibilities of savings in time, steel and expense, Parsons told the House Armed Services oil subcommittee.

Representatives from the oil industry point out that experimental work in turbine drilling has been carried on in this and other countries for several years. In no area, with the possible exception of Russia, has it replaced existing drilling practices. Russia is reported to be using adaptations of turbine drilling on a limited scale.

The turbine drill is completely interchangeable with the rotary, for which it can be substituted when drilling reaches a depth which imposes heavy strains on the string of pipe used by the latter. Whereas in rotary drilling power is exerted at the top of the string, raising tremendous stresses at great depths, Parsons explained, the turbine exerts its driving power at the bottom of the hole through a hydraulic turbine motor powered by a drilling fluid circulated the same as in rotary drilling.

Explaining that the turbine drill operates with a drive shaft as short as 35 ft. instead of the up to 15,000 ft. encountered in rotary drilling, Parsons said it offers a saving in steel because wear on the drill pipe is correspondingly reduced, savings in time because breakdowns are eliminated and the penetration rate increased, and economy in cost because power consumption is lower.

C. L. Moore, petroleum engineer of the Bureau of Mines, said that he agreed in the main with Parsons' claims but pointed out a considerable amount of field work will be necessary to verify them.

War Record Shows Fallacy of Relying on Undeveloped Reserves

by Dahl M. Duff

District Editor, Houston

THE fallacy of relying on proven or possible oil reserves of government lands for the nation's petroleum security in time of an emergency is again being pointed out as a part of the current controversy of federal vs. state control of the marginal sea.

Actively developed and producing fields privately operated under state regulation provided the tremendous quantities of oil needed for the last war. Federal reserves which must be developed after war comes, are able to contribute little.

Former Secretary of the Interior Harold L. Ickes last week told a joint congressional committee studying the "tidelands" quitclaim bill that he would have the offshore oil areas made a naval reserve. Informed Texans believe Ickes statement, along with indications others in the federal Government share this philosophy, makes all the more imperative passage of the measure returning the tidelands to the states.

A list of 15 major Texas fields (see accompanying table) illustrates the industry contention that active development of oil areas must come in peacetime and not after an emergency has arrived. Most of these 15 Texas fields were discovered in the early 1930's.

Production Still High

In July 1941 their total production was 209,847 bbl. daily. Four years later, at the peak of war demands, these fields were producing more than three times this amount, or 674,400 bbl. daily. These same fields are now holding their production at nearly wartime levels, and last November produced 659,300 bbl. daily, a drop of only little more than 2 per cent from the 1945 peak.

Whatever oil the Government withdraws from private development is drilled and produced at a great expense of needed steel and manpower after war comes, and further, the existence of these "reserves," in the opinion of industry sources, often has the effect of retarding the normal continued growth of the domestic industry.

Military in Background

Arguments over the usefulness of petroleum reserves such as Ickes would set up on the continental shelf are not new. Some industry observers feel that the anxiety of the Army and Navy over adequate oil supplies may lie in the background of the present tidelands dispute. A part of the pressure for federal control, they think, is stemming from the military, particularly the Navy, which traditionally has held the oil-reserve philosphy. On the other hand, another group believes that the Government's efforts are simply another attempt to extend and broaden federal power and authority.

Several other developments in the tidelands controversy were a subject of discussion last week in various Texas oil circles. There was considerable optimism that Congress will pass the quitclaim bill (S 1988) but much less hope that it will not be vetoed. Failure of the legislation to pass, in the opinion of several lawyers, will result in years of litigation to establish the claims of other states and to lay down definite federal-state boundaries.

S 1988 would release to the states the federal claim to seaward areas within their established boundaries, or in the case of states having no established boundaries, to 3 geographical miles. Texas, which came into the Union with 10½-mile boundaries, last year extended its boundaries to the edge of the continental shelf, and Louisiana in 1938 moved its boundaries 27 marine miles from shore.

In the case of some other states, even S 1988 might lead to some practical difficulties at the boundary of the state-federal areas of control. In September 1945 President Truman extended the jurisdiction of the United States to the edge of the continental shelf, and thus federal dominion would lie beyond the established state boundary or the 3-mile limit under S 1988. Boundary determination would be difficult, and industries developing the area, such as oil or fishing, might find themselves subject to conflicting regulations.

Despite this possibility, however, the measure now pending in Congress is considered to offer the best possible solution at the present time since it would restore the status that existed prior to the Supreme Court's decision in the California case.

Management Bill Opposed

Another point raised recently has to do with the administration bill (S 2165) which sets up the system by which the Department of the Interior would administer whatever offshore lands the federal Government controls. This bill contains all of the undesirable features, such as acreage limitation, control of operations, and government right to purchase development, that characterized the old federal leasing system of western public lands, industry leaders have emphasized.

One "joker" is seen in the bill's provisions that 90 per cent of the revenue from leases on federal offshore areas would go to the states, and only 10 per cent to the U. S. Treasury. Under the bill, the states would receive money only from lands leased within the 3-mile belt. Beyond that all revenue presumably would go to the federal Government.

Opponents of the federal leasing bill have called its revenue provisions a bid for the support of inland states. It provides that 52½ per cent of the money shall go into the national reclamation fund which finances water and irrigation projects in 17 western states, 37½ per cent would go to the state off whose shores the oil was found, and the remaining 10 per cent to the federal treasury.

(For a detailed article on what Kerr-McGee Oil Industries, Inc., is doing and plans to do in the Gulf of Mexico in spite of the threatened tidelands suit, see page 96 of this issue.)

TABLE SHOWING HOW PRODUCTION WAS INCREASED IN ESTABLISHED TEXAS FIELDS TO SUPPLY WAR DEMANDS AND PRESENT PEACETIME RECORD REQUIREMENTS

	Year of discovery	Production, barrels daily		
		July 1941	War peak July 1945	November 1947
Conroe	1931	30,034	63,000	61,200
Webster	1937	8,126	59,900	58,900
Hastings	1934	19,977	63,200	59,300
Anahuac	1935	12,689	33,700	30,200
North Cowden	1930	13,297	30,000	26,100
Yates	1926	14,351	47,300	49,900
Van	1929	9,262	33,200	29,900
Thompsons	1931	12,234	37,900	46,500
Tomoconnor	1934	14,565	54,400	49,300
Wasson	1937	36,136	70,200	77,800
Slaughter	1936	12,843	74,100	54,800
Seeligson	1937	338	34,100	34,200
Old Ocean	1934	12,686	18,500	14,800
West Ranch	1934	9,816	20,600	19,200
Hawkins	1940	3,513	34,300	48,200
Totals		209,847	674,400	659,300

Ickes Says Security Depends on Civilian Control, Mexico Pipe Line

WASHINGTON. — A blueprint for national oil security, with emphasis on civilian control and management of all federal activities, including the procurement of oil for the military, was laid before the House Armed Services oil subcommittee March 11 by former Secretary of the Interior and Petroleum Administrator Harold L. Ickes.

Asked by subcommittee chairman Dewey Short of Missouri to summarize the basic principles that should enter into a national oil policy, Ickes led off by telling Congress it had been derelict in dealing with the problem and the only policy in the past has "been to let the oil companies exploit recklessly, wastefully and inefficiently" to "make all the money they can."

The keynote of his suggestions was national self-sufficiency, and he warned that no reliance can be put on overseas resources, even as close as Latin America because, he said, in the next war "planes will be so efficient they will blow every tanker off the surface of the ocean." Only Mexico offers a source of wartime oil, to be brought into this country by pipe line, he said.

In the event of war we will need much more than the 2,000,000 bbl. daily of additional oil estimated by Defense Secretary James V. Forrestal, he said, "and we don't have an extra barrel in the United States today."

Lists Recommendations

"What we ought to do," said Ickes, is:

"Discover, if we can, some reserves that haven't been discovered, if they exist, and develop wells and perhaps build refineries but not refine a barrel." Such reserves, he suggested, might be found in the public lands in Wyoming, and the federal Government should undertake the exploration and development.

"Where oil has now been discovered, if it is possible to get it, hold whole pools as reserves." There is no use in doing what we did in Teapot Dome, where enormous quantities of oil were lost "because the Navy didn't have sense enough to put down offset wells" to overcome drainage, but the Government might well consider going in and buying discoveries that cannot be drained by outside wells.

"Import oil just as rapidly as we can and store it," underground if possible.

"Go ahead with development of synthetics. If war comes and we have to depend on synthetics and have to start to build the plants, it would take several years. There would be a contest for steel and Lord knows when we would have enough for those plants. Build now and keep the plants in stand-by until an emergency arises."

"Stop waste. The big companies have gone further than some people imagine in the last few years in stopping waste but there is still enormous waste of gas. Get the gas to market where it can be used; it will mean less demand for oil."

"Investigate the continental shelf," but there is as yet no legislation permitting such activity.

"We should have a very complete overhauling of the Federal Leasing Act. I think we have been selling our oil too cheaply."

Keep Steel at Home

To accomplish these objectives, Ickes said, steel now being exported should be kept at home. The Trans-Arabian pipe line is highly desirable, he said, pointing out that he first proposed it, but would be valueless in the event of war and could be deferred until the national security of this country was assured.

Ickes interrupted his recommendations frequently to give his views on various subjects.

He charged the military with being uncooperative during the war and refusing to give PAW advance information on what it would need or data on inventories because he "didn't wear an ensign's uniform," making it necessary for PAW to "outguess" the Army and Navy to provide what would be required.

He charged also the military now is attempting to take into its own hands all questions connected with procurement, which he contended should be handled by civilians.

He is "confused" by the so-called "managment" bill on the tidelands.

No Navy Control

Control and operation of the naval oil reserves, which he said should be renamed "national oil reserves," should be in the hands of civilians.

He "always wondered" why the Federal Power Commission had jurisdiction over natural gas, which is a petroleum product and should been controlled, if anywhere, in the Interior Department.

He does not believe in commissions and rejected a suggestion by Rep. W. Sterling Cole of New York that a commission representative of the oil industry, large and small, and the Government, be set up to study the question of policy. The information necessary for such a determination by Congress, he said, could readily be developed by the Interior Department, but it would take legislation to make the department move.

"I know what would happen," he said. "Your commission would hire geologists and scientists, and probably the first one would be the famous Mr. DeGolyer of Texas, and they would make a report and the commission would meet and solemnly adopt the report."

Favors Federal Control

Ickes disagreed with OGD Director Max W. Ball that, so far as the oil was concerned, it would make no difference whether the Government or the states owned the tidelands, contending the federal administration would bring about "less waste, less overlapping and inefficiency, and less graft."

In the international field, Ickes said the long-pending British-American petroleum agreement should be ratified, but indicated doubts that it now would serve its original purpose of a basis for a similar agreement with Russia and all other countries. It was planned, he said, to enter into negotiations with Russia as soon as the agreement was ratified, but the long delay in getting Senate approval probably would make such talks now impossible.

He suggested also that Congress might give some attention to the situation created by American oil companies which incorporate subsidiaries abroad and pay no taxes on their profits to the Treasury.

Also, it might look into the prices charged for Middle East oil which he said have no relation to cost of production but are based on what the traffic will bear.

And finally, an agreement might be made with Mexico to help in the development of her oil resources—but not without protection to American investments—and the possibilities of construction of a pipe line between the two countries.

Ickes agreed with Rep. Overton Brooks of Louisiana that the concentration of refineries and storage facilities on the Gulf and Pacific coasts is dangerous, and suggested that all future refineries be built well inland.

Condensate Price Posted

HOUSTON.—A price of $2.65 a barrel for condensate from Cayuga field, Anderson County, Texas, has been posted by Pan American Production Co. effective March 1. Pan American has heretofore been buying condensate in the field on the posted crude schedule, which provides a price of $2.40 for 29° and above gravity.

this week

TIDELANDS—Foe of tidelands-return bill charges Justice Department planned to lose when suit was filed. . . . Suggests quitclaim for all public lands if tidelands are "given" to states. . . . ¶Texas Supreme Court upholds state's claims to offshore lands. . . . Rules state law requiring license for out-of-state fishing boats not unconstitutional. . . . ¶McCollum Exploration Co. seeks permit for seismic survey of offshore tracts leased by Benedum interests. . . . ¶Texas oil men charge reliance on undeveloped federal reserves a fallacy. . . . Seek active private development of offshore areas. . . . Point to record of producing Texas fields during recent war. . . .

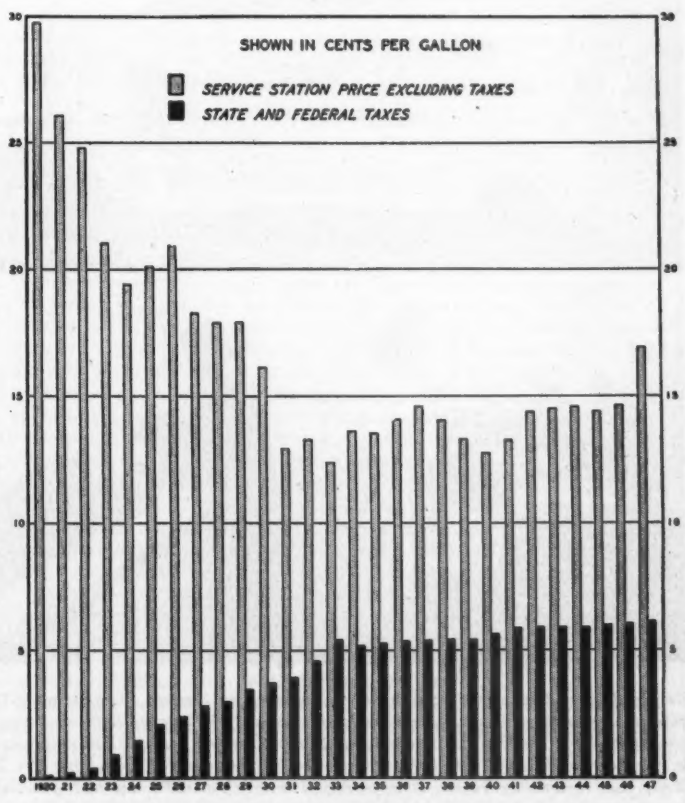
CONTROL—Completely free oil industry can develop productivity adequate to meet any emergency, B. A. Hardey tells House subcommittee. . . . Declares producers "alarmed" at efforts to restrict efforts of industry. . . . ¶Former Interior Secretary Ickes presents plans for oil security. . . . Says civilian control essential and strongly opposes Naval reserves. . . . Scorns dependence on foreign oil except that in Mexico. . . . Urges construction of pipe line to United States from Mexican fields. . . .

INTERNATIONAL—Arabian American Oil Co. announces $350,000,000 program of expansion in the Middle East over the next few years. . . . An additional $190,000,000 will be spent in constructing Trans-Arabian Pipe Line Co.'s 1,075-mile line. . . . Directors of both companies say construction programs will continue regardless of present conditions in the Middle East. . . . ¶French oil industry official seeks more steel for refineries in France. . . . Says Marshall plan supplies might prove inadequate. . . . ¶Britain plans 175,000 gross tons of tanker capacity for 1948. . . . This compares with 120,000 tons in 1947. . . . ¶J. Edward Jones tells Senate committee development of Mexican oil resources is being hindered. . . . Big oil companies and steel producers are responsible, says Jones. . . . ¶Aramco reveals completion of 17 wells in Abqaiq field and 3 at Buqqa in Saudi Arabia last year. . . .

EXPORTS—Export quota for current quarter raised 300,000 bbl. by Office of International Trade. . . . Boost necessary to take care of hardship cases, OIT explains. . . . To allow exports only when contract agreements were completed and transportation arranged prior to February 20. . . . ¶House rules committee defies opposition, buries Heselton bill calling for 30-day embargo on exports. . . . Heselton refutes many charges hurled in support of his bill. . . .

TRENDS—Stocks of four major products show drop of 1,500,000 bbl. during week ended March 6. . . . Gasoline stocks, rising steadily for many weeks, gain only slightly in March tapering off. . . . Residual oils show heaviest drop in many weeks, dropping 1,092,000 bbl. during week. . . . Distillate stocks continue downward trend, with total United States stocks dropping 1,100,000 bbl. and East Coast "shortage" area stocks falling 250,000 bbl. . . . Nation-wide kerosine stocks show first gain since first week in November, but stocks on East Coast drop from 3,725,000 to 3,515,000 bbl. . . . ¶Production of kerosine again sets new record, with total output for the week of 2,821,000 bbl., against previous record high of 2,780,000 set a week earlier. . . .

REFINING—Sinclair Refining Co. completes 25,000-bbl. fluid catalytic cracking unit at Marcus Hook refinery. . . . ¶The Texas Co. begins work to modernize its Lawrenceville refinery. . . . Facilities will include crude and vacuum distillation unit, fluid catalytic cracking unit, and catalytc polymerization unit. . . .


SHOWN IN CENTS PER GALLON
SERVICE STATION PRICE EXCLUDING TAXES
STATE AND FEDERAL TAXES
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15
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1920 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47

Illustrating how taxes are taking an increasing percentage of the total retail cost of gasoline in the United States is this chart, which appears in the annual report of The Texas Co., released March 16. Entitled "Decline in Retail Prices of Gasoline as Compared with the Increase in State and Federal Gasoline Taxes," the chart shows the trends as determined from the annual averages of 50 representative cities in the United States

Free Oil Industry Would Meet All Emergencies, Hardey Declares

WASHINGTON.—Hysterical proposals for the production of our domestic oil reserves in solving current shortages were denounced last week by B. A. Hardey, Shreveport, La., independent operator and chairman of the State Mineral Board.

Testifying before a House Armed Services subcommittee investigating the adequacy of petroleum supplies for the military services, Hardey declared that, if left alone, the industry will quickly develop a productivity adequate to meet any emergency that may arise within a period of a few years, but admitted that "we producers feel considerable alarm now that there are efforts to restrict the industry in ways that would strike at the fundamentals of the freedom of effort to discover, to develop and produce."

The most important current problem, he said, is the tidelands question, in which "at best, the federal Government is seeking to engage in a novel experiment, fraught with trial and error."

Attacks Management Bill

Hardey challenged the contentions of Interior Secretary J. A. Krug that federal control of the submerged lands is preferable because of the great economic value of their resources and the Government's need for them, particularly in time of war. He also attacked the administration's "management" bill, which he declared sets up so many objectionable conditions that he and many other operators, large and small, would be reluctant to undertake development under a federal lease.

Speaking of the administration's proposal, he commented that "had this been the governing policy of the United States the automobile might as well not have been invented."

"This is one more manifestation—a very large one—of a philosophy which some in Government have been trying to establish," he said. "The philosophy has two major aspects; first, that true conservation means withholding from use, and second, that the federal Government is the only institution which has a regard for the public welfare. Both are without validity.

"Today, the doctrine of repression of effort is being asserted with great solemnity."

Hardey pointed out that other evidences of this new "philosophy" are found in the suggestion of E. DeGolyer that the Government import oil from abroad and trade it for domestic reserves in properties which would be withdrawn from activity; the gradual approach to an interference in the natural-gas industry "which is detrimental to the consumers and in interference with the conservation activities of the states"; the export of great quantities of steel for use in the Middle East which has been held paramount by the Secretary of Commerce at the same time the Secretary of National Defense warned that Middle East oil could not be depended upon in the event of war and that, therefore, enormous tonnages of steel should be devoted to the creation of a synthetic-fuels industry.

"I cannot believe that the proposal to extinguish the producing industry of the United States will gain many adherents," he said. "It is a program of hybridization—the strain is ended after the first generation. It is a program combining the principal features of the WPB, old-age pension and the mass slaughter of the little pigs.

More Drilling Urged

"There is a time-tested method of assuring the nation of an adequate and available supply of petroleum and products here at home where it can be taken to the consuming points by more than one form of transportation. That method is the same one we have always used; it is simply to drill enough wells."

Hardey agreed that development of the Middle East and other foreign sources is desirable in the long-range program, as is the development of synthetic fuels, but contended that the emergency toward which those activities would be directed might descend upon us long before either was completed, in which event the use of the same quantity of steel in the United States would put the industry in position to guarantee to meet the needs of the armed services.

"Petroleum would be found in sufficient quantity for all purposes if the burdensome restriction of a high tax were removed," he said after pointing out that the industry now has a satisfactory price structure to stimulate exploration and development.

HUMBLE INTRODUCES NEW MOBILE MEDICAL UNIT

New mobile medical unit placed in service recently by Humble Oil & Refining Co. to provide free, voluntary physical examinations for about 7,000 Humble field employes in Texas, Louisiana, New Mexico, and Mississippi. The unit, which cost $20,000, will require about a year to tour Humble's 300 field camps. The 34-ft. trailer van is divided into laboratory, X-ray, and examining rooms. It is equipped with air-conditioning and gasoline heating.

Wherry Committee Continues Critical Probe of Oil Industry

WASHINGTON.—"The greatest conspiracy to restrain trade ever concocted" exists between big oil companies and the steel producers for the purpose of eliminating independent oil operators and in particular to prevent development of Mexican oil resources, the Senate small business committee was told March 12 by J. Edward Jones of New York.

Jones, who has a contract with the Mexican Government to drill 100 test wells and develop any oil fields so discovered, testified that he had been unable to secure the tubular goods necessary for the drilling of the first well, now under way a few miles south of the Texas border.

Equipment supply, he said, is a major factor supporting the alleged oil monopoly, with the big companies buying up all available steel, and while he is able to purchase drilling rigs without difficulty he has been unable to get the relatively small amount of drill pipe and casing which his project requires.

Jones, who said he had approached a number of steel companies in a vain effort to get pipe, promised to furnish the names of the companies and their replies.

Opposed by State Department

Jones alleged also that the State Department had attempted to influence the Mexican Government against him, but without success, and asserted also that when the Navy was badly in need of oil which could be procured from Mexico and a procurement officer sought to buy it, he was prevented by the Secretary of the Navy on the ground the State Department did not wish to give Mexico any encouragement until it had "made peace with the oil companies."

He topped his charges off with an allegation that the Bureau of Mines forecasts and the state proration laws contributed to monopoly and, in answer to a question by Chairman Kenneth S. Wherry of Nebraska as to the effect of suspension of proration, said that 300,000 to 500,000 bbl. daily additional could be produced in Texas alone.

Under questioning by Sen. E. H. Moore of Oklahoma, however, Jones admitted the increased production would come from West Texas, where lack of transportation is holding back production, and that East Texas could not produce more without adversely affecting the reserves.

Jones, who said he was to be paid by Mexico in oil and estimated he would receive up to 10,000,000 bbl. as a result of his initial work, testified that other countries had approached him with similar deals. He said one "Near East" country wrote the State Department about it and the department suggested it deal with a big company.

Hadlick Scores Proration

In a report on the effect of federal and state controls on the independent branch of the industry, Paul E. Hadlick, special counsel for the subcommittee, said it has been "most disastrous," and that all efforts to solve the shortage have been approached from the consumer angle only.

The only real solution to preservation of the independent is the reestablishment of competition through the elimination of many of the restrictions on production, Hadlick declared.

Hadlick asserted the real purpose of proration was "to restrict production and raise the price of crude oil." He charged the states follow the Bureau of Mines forecasts. Proration, forecasts and the Connally "hot oil" act have formed a "platform for price increases," he said, warning that "more price rises are in the making, and there will be great dislocation among consumers, and bankruptcy for many oil distributors and cooperatives, if some action is not soon taken to upset this platform of control."

The committee counsel argued that the plea of conservation on which proration is based is a mockery, since in January 1947, the country was producing only 4,531,000 bbl. daily while in the same month this year it was producing 5,313,000 bbl. without any new discoveries of prominence, which "gives the lie to any talk of the use of engineering principles in the production of crude oil."

Hadlick paid his respects to Interior Secretary Krug's warning that price and rationing controls will have to be imposed next winter, which he said is "typical of the philosophy of the Interior Department to get and hold all the controls on oil it can."

Forecasts Responsible

"All the Interior Department has to do is to fire its tender board in Texas, quit issuing the forecasts of demand, ask Congress to repeal or suspend the Connally Act and approval of the Interstate Oil Compact, and then request the attorney general to follow up on any connivance that might go on between the oil producing states and/or the large oil companies, and there would be a chance to return the oil industry to a private competitive economy," he said. "It is the direct assistance of the federal Government that has made these state proration laws work so perfectly in restrain of trade."

Charges that the Bureau of Mines' monthly forecasts consistently underestimate demand, that the states follow the production recommendations of the reports, and that if the esti-

(Continued on page 167)

COMING NEXT WEEK

Next week's Journal will be a special 256-page issue featuring "Natural Gasoline." Included will be a report on the twenty-seventh annual convention of the Natural Gasoline Association of America at Fort Worth March 24-26 and reports on many new developments in natural-gasoline and L.P.G. plants and cycling operations. Papers which will be included are: "Significance of Liquids from Natural Gas," "Modern Process Methods to Improve Light Ends Recovery," "A Study of Cycling Operations in the West Austin Sand," and "More Propane for Less Money."

The Journal's statistical department will feature its regular annual survey of natural-gasoline and cycling plants, listing all individual plants for each company and giving location and present manufacturing capacity. A report will be given of all current gasoline and cycling-plant construction, and another Journal prepared article will feature the present all-time high production position of the light-hydrocarbon industry.

The special issue also will carry an authoritative paper by a Gulf Oil Corp. technician providing the engineer with all procedures and data necessary to obtain the complete story of condensate reservoir fluid behavior for a given cycling operation. Articles by Journal editors will include a write-up of one of the latest and most modern gasoline plants to be put on stream, and an account of the 100-million-dollar-plus expenditures one oil company is making in its expansion moves into natural-gasoline, cycling and synthetic-gasoline projects.

All in all, the forthcoming issue will be the most comprehensive treatment the Journal has ever published on the natural gasoline-L.P.G.-cycling industry.

International

WORLD-WIDE OIL DEVELOPMENTS

Arabian American Planning Huge Middle East Construction Program

ARABIAN AMERICAN OIL CO. will spend an estimated $350,000,000 in a major investment program over the next few years.

The program will include increased crude-oil producing facilities, pipe lines, refining, housing, and other facilities, according to the annual report of The Texas Co., now a 50 per cent owner of Arabian American. The report was released by W. S. S. Rodgers, board chairman, March 16.

In addition, an estimated $190,000,000 will be spent in the construction by Trans-Arabian Pipe Line Co. of the 1,075-mile Tapline, which will carry crude oil from Saudi Arabian fields to the Mediterranean. The first mile of this 30-31-in. line was laid in its permanent position February 26 and construction is now progressing at the rate of about 1 mile a day, according to B. E. Hull, Tapline president.

Commenting on the Middle East oil picture, The Texas Co. report said:

"Regardless of the present disturbed condition in the Middle East, the directors of Arabian American Oil Co. and Trans-Arabian Pipe Line Co. have decided to proceed with these two programs in the belief that the completion of these projects will do more to alleviate the present worldwide shortage of petroleum products than anything else. Furthermore, it is their belief that these projects are of the greatest importance to the success of the Marshall plan."

Relations Good

Texaco's annual report also stated that "the relations of these two companies with the Saudi Arabian Government continue on a friendly basis." But, it continued, "one must realize that a delicate international and political situation exists in the Middle East which might seriously affect these companies."

About 40 miles of 30-in. pipe and about 40 miles of 31-in. pipe have been received at Ras Misha'ab, Tapline's new port on the Persian Gulf for use in the Trans-Arabian line, according to Hull.

Approximately 25 miles of pipe have been welded at the Ras Misha'ab base into strings of three lengths, each 93 ft. About 23 miles of pipe last week had been trucked out and distributed along the pipe-line right-of-way. The first sections of pipe are being laid on the Abqaiq-Qatif leg of the route, near the Persian Gulf. All but 200 miles of the Trans-Arabian pipe-line route lies within Saudi Arabia.

Previously announced plans indicate that Sidon, in Lebanon, will be the Mediterranean terminus of this line. However, the Syrian Parliament has not yet ratified the necessary right-of-way. Unconfirmed reports state that Tapline officials again have been considering some point in Egypt as a possible Mediterranean terminus.

Base Nearing Completion

Hull reported that the construction base at Ras Misha'ab, which was started last July, is now 90 per cent complete. The base includes ship-unloading facilities, barracks, mess halls, recreational facilities, field hospital, gasoline and diesel fuel tanks, bulk materials storage yard, automatic pipe-welding plant, and custom house.

Discussing foreign production, the Texaco report said Arabian American, in which The Texas Co.'s interest will be reduced to 30 per cent if certain agreements are consummated, had a crude-oil output in 1947 of about 60,000,000 bbl., or a daily average of about 246,000 bbl., compared with 60,000,000 bbl., or a daily average of 164,000 bbl. in 1946. In 1947 the company's refinery at Ras Tanura ran to stills approximately 39,000,000 bbl. of crude, compared with 29,300,000 bbl. in 1946.

Crude-oil output in 1947 of Bahrein Petroleum Co., Ltd., in which Texaco has a 50 per cent interest, totaled about 9,410,000 bbl., compared with 8,010,000 bbl. in 1946. Bahrein's Persian Gulf refinery ran to stills about 45,900,000 bbl. of crude in 1947 against 34,070,000 bbl. in 1946. Requirements in excess of Bahrein's own production were purchased from Arabian American.

Andre Asks Hike in French Steel Quotas

IF French refineries are to process 15,000,000 tons (about 307,500 bbl. daily) by 1951, which is according to current projected plans, then the United States must allocate more steel for France.

This is the opinion of Robert Andre, president of the French Petroleum Industry Association and president of Standard Francaise des Petroles Soc. Anon., an affiliate of Standard Oil Co. (N.J.). Currently the French refineries are supplying the domestic market with 80 per cent of requirements.

During 1947 the French refinery construction program will receive 80,000 tons of steel as against 38,000 tons in 1947, according to M. Gallieni, general delegate to the French Road Union.

Commenting on oil supplies under the Marshall plan, Andre said that prospects for the 16 Marshall plan countries of western Europe can be considered encouraging as a whole. But as far as France is concerned, he said, American aid might be inadequate if supplies are based on 1947 consumption, since French consumption last year was below the 1938 level, a year that is considered more representative on which to base annual quotas.

In 1946 the Western Hemisphere supplied Europe with 77 per cent of the petroleum requirements, with the remainder coming largely from the Middle East. In the years immediately ahead, Andre said, Europe will have to rely heavily on the Middle East. By 1951, it is believed that the increases in United States consumption alone will reduce Western Hemisphere supplies to 20 per cent of total European requirements.

Cut in Drilling, Production Costs Demanded in Russian Oil Industry

RUSSIA'S current 5-year oil-industry plan calls for an initial investment of 370,000,000 rubles ($72,000,000) to be used largely in new drilling ventures, according to Dr. Hugo Burstin, widely known European technologist and chief chemist for more than 25 years in the Polish refining industry.

About 74 per cent of this total expenditure is allotted to actual drilling expense, 11 per cent to new compressor plants, and the remaining 15 per cent to meet other related costs.

The official journal of the Soviet Oil Ministry has published an interesting article by F. F. Dunayev in connection with economy measures which are to be introduced in the Russian oil industry. Some illuminating conclusions may be drawn from some of the working methods to be employed.

For instance, the bulk of the capital expenditures is required, not in the large oil areas of Azerbaidjan and Grozny, but in areas containing widely scattered wells with comparatively small outputs of oil. This statement, by Dunayev, is followed by the advancement of a general plan for the reduction of expediture and supported by examples and figures. The first economy measure recommended is extensive development of pressure maintenance in the stratum.

To Cut Investments

A further reduction of capital investments of 8,000,000 rubles (about $1,500,000) is expected to result from a 23 per cent increase in the speed of development drilling.

Other suggestions made with a view to reducing costs connected with development drilling are:

1. More extensive drilling of shallow wells, particularly in wooded or marshy areas not easily accessible; i.e., on the Kama River.

2. Making the most of drilling equipment. It is pointed out that in 1946 only 60 per cent of Russia's drilling equipment was in use, while 11 per cent was being assembled or dismantled.

3. A 23 per cent increase in the speed of development drilling is to be achieved by the end of 1950.

4. More extensive development of existing oil wells. Only from 60 to 70 per cent of the established wells are currently in operation.

5. More intensive and extensive use of existing refining plants. Nearly half of the working time is now being spent in repairs.

Greater development of drilling and refinery plants is to be achieved by means of a well-planned and strictly adhered to timetable, as well as specially devised working methods. Numerous graphs will define times prescribed for work, inspections, repair and other operations, while other graphs will record daily performance, expenditures on material, and the state of repair of machinery at the beginning of each year.

The various technical measures and improvements in organization which are demanded, with a view to reduced capital investments and better performance, point to numerous difficulties which the Russian oil industry has not yet overcome.

Shell Fields in Borneo Show Gain in Output

DAILY crude-oil production from Seria and Miri fields of Royal Dutch-Shell interests on the island of Borneo, East Indies, averaged 36,084 bbl. daily last year, according to official figures just released by Asiatic Petroleum Corp., Shell's United States subsidiary which handles foreign matters.

Of the 36,084 bbl., 35,591 bbl. came from Seria and only 493 from Miri. Last December's daily production averaged 49,500 bbl. at Seria and 800 bbl. at Miri. Combined production from Brunei (Seria) and Sarawak (Miri) in 1939 averaged 17,450 bbl. daily.

During 1947, a total of 83,572 ft. was drilled at Seria and 8,227 ft. at Miri. Twenty-one oil wells were completed at Seria and one at Miri. No gas was encountered or dry holes drilled in either field. At the end of the year, two wells were being drilled at Seria and one at Miri. One well was suspended in each field. At Seria there were 56 flowing wells and none on pump at the year's end, while there were 56 wells on pump and one flowing well at Miri. At Seria there were an additional 84 wells producing by gas lift. At the year's end there were 20 wells shut in at Seria and 19 shut in at Miri.

Cummulative production at Seria, from the discovery of the field in 1929 to the end of last December was 65,343,000 bbl. At Miri, cumulative production from 1911, when that field was discovered, to the end of last December, was 69,759,000 bbl. Both fields produce from Tertiary sands.

FOREIGN MEN GUESTS AT NOMADS MEETING

Foreign guests of the Houston Nomads at their monthly meeting March 8 at the Houston club are pictured here: Seated are H. C. Smith, Shell Oil Co., Colombia; John T. Gay, ARAMCO, Saudi Arabia; and E. E. McGar, Shell Oil Co., Ecuador. Standing are D. C. Livingston, International Petroleum, Ecuador, J. R. Coleman, Arctic Contractors, Fairbanks, Alaska

Port Jerome refinery as it appeared from the air prior to the war

Port Jerome Refinery, Destroyed By War, Exceeding Prewar Output

***by M. J. Jamieson** **

THE Port Jerome refinery on the Seine River in northern France is owned by a French company, the Standard Francaise des Petroles, in which American capital is represented by Standard Oil Co. (N. J.), Gulf Oil Corp., and Atlantic Refining Co. Crude supplies are brought in by tanker to LeHavre and thence by pipe line to Port Jerome.

Designed for a throughput of 18,000 bbl. per day, the refinery was completed in 1933 to produce a complete line of products, including lubricating oils and asphalt. In addition to atmospheric and vacuum stills, equipment included thermal cracking coils for octane improvement and solvent treating and dewaxing facilities for lube-oil production. Early operation proved the original design estimates to be conservative, and with special attention paid to removing production bottlenecks, Port Jerome achieved a prewar capacity of some 25,000 bbl. per day.

*Standard Oil Co. (N. J.)

In June 1940, when the German armies began to menace the Port Jerome area, military authorities in France ordered company personnel to destroy as much equipment and stocks as possible to keep them out of German hands. Storage and storage facilities were destroyed by running oil into the fire banks of all tanks and then burning the oil. Fire not only destroyed all stocks, but melted tanks and destroyed much other refinery equipment.

Nazis Took Equipment

During subsequent German occupation of the area much of the remaining plant was dismantled and taken to Germany. Among facilities removed in this manner was the entire boiler plant, two of the three cracking coils, two rerun stills, naphtha and kerosine treating plants, dewaxing plant, and numerous other pieces of equipment.

As a result of planned destruction, dismantling by the Germans, and the effect of weather over the subsequent long period of idleness, not much of use remained when Port Jerome finally was returned to its owners after the war. At considerable personal risk, however, loyal employes of SFdeP managed to salvage some extremely valuable equipment such as instruments and electrical machinery.

Immediately after the refinery was recovered from the enemy, reconstruction started under the direction of staff engineers and technical personnel of SFdeP with the assistance of its American stockholders.

In spite of manpower shortages and the lack of new construction materials, rehabilitation progressed at such

The same refinery following the war. View is looking southwest from phenol plant toward lube rerun still site

a rate that operations began again early in 1946. Ingenuity was the main asset in the early days, because all that was available in the way of equipment consisted of material that even to the Germans had not appeared worth moving. Rehabilitation is continuing, and the refinery has already exceeded its prewar capacity in that crude runs of 30,000 bbl. per day have been realized.

As a result of the heavy destruction of refining properties in France during the war, the country is still very short of refining capacity. In addition, the need for conserving dollars has placed emphasis on purchasing crude instead of finished products, so that every effort is being made to maximize throughput even at the expense of quality where lower qualities will result in increased production. SFdeP is, therefore, following this pattern in rebuilding Port Jerome. As a consequence, cracking facilities have not yet gone back into operation although it is expected they will early this year.

Demands Increasing

As French economy gradually improves, demands on SFdeP are increasing so that future plans for Port Jerome take into consideration increased production as well as improvements in qualities.

The magnitude of the task of rebuilding can be appreciated by comparing the accompanying protographs. Some reconstruction had begun before the later photograph was taken.

An interesting example of the work of German demolition squads is in their attempt to destroy the tower on the near side of the Seine River, on refinery property. The towers carry high-tension power lines over the Seine River as part of the distribution system for the Seine Valley.

When the Germans realized late in the war that they were about to lose the area, they set about destroying this important link in the power system. Crews carefully attached explosive charges to each leg of the tower, so that when the charges were simultaneously set off, approximately 10 ft. was blown off the bottom of each tower leg. As a result, instead of the tower collapsing on one side, it settled on slightly shortened legs, but still vertical.

Unfortunately for the rest of Port Jerome, German demolition work was usually much more effective.

30,000-Bbl. Refinery To Be Built in Italy

Construction of a 30,000-bbl. daily refinery near Apuania, Italy, is being planned by joint Swiss-English interests, according to Italian press reports. The output of this refinery would be for domestic use only.

Other expansion plans of the Italian oil refining industry are said to include a plant with a daily capacity of from 16,500 to 20,250 bbl. to be erected in the Carrara zone.

Anic Standard Oil may increase the capacity of the Bari and Leghorn plants to 9,750 bbl. daily and 30,750 bbl. daily, respectively. (Anic is an abbreviation of Azienda Nazionale Idrogenazione Combustibili).

Agip Anglo-Iranian may build a plant at Marghera with a daily throughput of 20,250 bbl. Other companies planning a throughput increase include Raffineria de Napoli S.A.I. (Socony-Vacuum Oil Co., Inc.) and Lambarda Petroli, Ltd.

Meanwhile, the Italian Marine Ministry has announced that 10 of the 16 tankers, of 10,200 tons each, allotted Italy by the U. S. Maritime Commission, are slated to leave the United States soon.

According to the Italian Ministry of Industries, the current refinery throughput in Italy approximates 2,180,000 tons annually, or 44,250 bbl. daily.

17 Wells Completed in Abqaiq Field in 1947

Of the 20 oil producing wells which Arabian American Oil Co. brought in last year in Saudi Arabia, 17 were in Abqaiq field and 3 at Buqqa. Aramco had a dry hole at Abqaiq and one at Qatif.

The Buqqa area is now definitely considered as the northeast extension of Abqaiq. On the basis of last year's operations the estimated proven acreage at Abqaiq is now 50,000 acres and at Dammam, 9,000 acres.

Of a total crude-oil production in 1947 of 89,851,645 bbl., 53,659,715 bbl. came from Abqaiq, 34,816,451 bbl. from Dammam, and 1,375,479 bbl. from Qatif.

Socony-Vacuum Soon to Complete Barinas Test

Socony-Vacuum Oil Co. of Venezuela expects to complete its seventh test well in the Barinas area, south of the Andes in western Venezuela, by the end of March or early April.

The discovery well, 2 Silvestre, which was bottomed at 9,766 ft., produced considerably in excess of 800 bbl. daily on a ¼-in. choke. Production comes from the Eocene formation. Sands were found from 8,600 to 9,400 ft. The crude oil was of 26° A.P.I. gravity.

As 2 Silvestre is located in a particularly remote area, company officials have been reluctant to state whether they can consider the discovery well to be a commercial producer in the usual sense of this term. Other details of Socony-Vacuum's Barinas operations were published by The Oil and Gas Journal, November 1, 1947, page 43, and January 29, page 145.

Pemex Gets Second Producer in Veracruz

A second successful oil well has been completed in Veracruz state in Mexico, it was announced by Antonio Bermudez, Pemex director. The new well, El Moralillo, is located 5 miles from Cerro Azul, and is in the same area as the first well at San Miguel. Production figures for the new well were not available but were expected to be "high," according to Bermudez.

Shell Orders Withdrawal Of Romanian Personnel

Shell Oil Co. of London has ordered its British management personnel consisting of five men to withdraw from activities in Astra-Romano Oil Co., a Shell subsidiary in Romania. The company, which produces 35 per cent of Romania's oil, will be operated by a Romanian government supervisor.

Astra-Romano and a subsidiary were both appointed government supervisors in December 1947 when the two companies were accused by the Communist-dominated government of "stealing" oil from neighboring perimeters. The supervisors were appointed pending substantiation of the charges in court.

New Well in Turkey Producing 300-400 Bbl.

The first successful wildcat completion for Government Oil Co. of Turkey, Maden Tetkik ve Arama Enstitusu, in the southeastern part of the country, is swabbing 300 to 400 bbl. daily of 15°-gravity asphalt-base oil at a depth of 4,390 ft., according to J. E. Brantly, president of Drilling & Exploration Co., Inc., which has supervision of drilling operations for the Turkish Government.

The well, which is located near Diyarbakir in the Tigris Valley of southeastern Turkey, marks the first successful completion as a result of the government's extensive postwar program to find oil in that country.

Colon Output Drops

Venezuelan crude-oil production of Colon Development Co., Ltd., (Shell) for the 4 weeks ended March 1 totaled 315,479 bbl., or 11,267 bbl. daily. This compares with 403,488 bbl., or 11,528 bbl. daily for the 5 weeks ended February 2.

Oil Dropped From Bogota Agenda; More Aid for Latin America Asked

WASHINGTON.—Members of Congress who had urged that oil be made a major subject of consideration at the inter-American trade conference which opens in Bogota, Colombia, March 30, expressed disappointment last week over information from the State Department that petroleum would not be on the agenda.

Department officials admitted that the subject had been dropped from the calendar at the suggestion of a "friendly country," later informally identified as Venezuela, but said that, nevertheless, oil undoubtedly would be a subject of discussion.

As one official pointed out, it will be impossible to discuss such matters as economic development or industrial expansion without oil coming into the picture.

Back of the move to drop oil from the schedule appears to be no particular desire to avoid discussion but, rather, an idea of preventing the embarrassment of any participating delegation which might not be prepared to talk about revision of the laws which now prevent United States companies from operating in all but three of the Latin-American countries.

Meanwhile, another possibility of Western Hemisphere oil development was raised at the Capitol last week.

Mexican Aid Sought

Although there was nothing to indicate that there had been any interchange of views among them, there was a striking similarity in statements made on the floor of the Senate by Sen. Dennis Chavez of New Mexico, before a House armed services subcommittee by former Interior Secretary Harold L. Ickes, and before the Senate small business oil subcommittee by J. Edward Jones, New York oil operator.

Both Ickes and Chavez put forth the idea of United States cooperation with Mexico in the development of her oil resources and the possibility of building a pipe line to bring Mexican oil into this country, particularly in the event of war.

"The oil of Mexico, the oil of Colombia, the oil of Venezuela, are more important to us than oil of Saudi Arabia," Chavez commented.

The senator attacked the Middle East development as the activity of "a huge oil combine" which might require tremendous cost in dollars and lives to defend, and urged that instead of sending steel to that area it be diverted to the North American petroleum industries.

Big Companies "Jealous"

Chavez charged that Mexican development has been handicapped by "powerful and sinister" forces. The companies whose properties were expropriated 10 years ago are keenly desirous of returning to Mexico, he said, but only on their own terms and "are jealous of any independent enterprise that gives promise of developing, on any fair basis other than one which they themselves control, the great petroleum reserves of Mexico," while the steel companies, he alleged, "follow a definite policy of cultivating their so-called big-business oil-company customers."

Instead of a $600,000,000 hemispheric recovery program that the State Department is readying, he said, the department can accomplish more "by insisting that American industry, especially the steel industry, furnish Mexico with oil machinery to develop its potentials" and at the same time relieve our own oil shortage.

Texas Court Reaffirms Claims to Tidelands

AUSTIN.—The Texas State Supreme Court has indirectly upheld the state's claim to its offshore lands in the Gulf of Mexico.

The court March 10 reversed a District Court finding in Corpus Christi that a state law requiring a $2,500 license for out-of-state fishing boats is unconstitutional. The decision had the effect of approving the state's title to fish in the Gulf waters.

Last November the State School Land Board leased for oil development approximately 378,000 acres in the Gulf of Mexico. Ownership of the submerged lands was placed in question by last year's "tidelands" decision of the U. S. Supreme Court, and U. S. Attorney General Clark recently said he will file suit for the Texas submerged areas.

Gulf-Atlantic Tankers Released By U.S.M.C.

WASHINGTON. — The Maritime Commission last week released all tankers which had been "frozen" in the Gulf-Atlantic service and opened the way for chartering of American registry vessels for foreign operation.

Effective March 15, it took all controls off both domestically owned tankers and those which had been sold foreign but required to make at least one coastwise trip before leaving United States waters.

The commission said also it was now "disposed" to grant applications to charter American-owned tankers to foreigners under contracts which do not extend beyond next September 30, and that charters for longer periods, while not ruled out, would be considered on their individual merits.

Early next September, it said, the whole tanker situation will be surveyed to determine whether any action is necessary to insure adequate transportation facilities during the winter season.

Suspension of Connally Act Opposed by Thompson

AUSTIN.—Col. E. O. Thompson, chairman of the Texas Railroad Commission, has expressed his opposition to a proposal that the Connally "hot oil" Act be suspended in an effort to aid the current undersupply of oil products.

In a statement, Thompson indicated he believes suspension of the law is unnecessary or undesirable. He pointed out that Texas fields are now allowed to produce at their maximum efficient rate. Suspension of the Connally Act was asked by Senator Wherry (Rep., Neb.). The law makes a federal offense of shipments in interstate commerce in excess of state allowables.

The Texas commission announced in February it will hold a series of hearings in April to determine if Texas fields are capable of producing above present levels, with a view toward a possible increase in MERs. *(The Oil and Gas Journal, February 12, page 56).*

Carter Plans Addition To Tulsa Laboratory

Construction of a two-story addition to research laboratories of Carter Oil Co., Tulsa, will begin immediately company officials announced this week. The new south wing will add 10,000 sq. ft. of space and will cost an estimated $170,000. Completion is expected by October.

A "shielded room" with a double shell of metal inside five 5-in. walls will be included in the new section to be built and will be used for experimental electronics tests.

Carter recently completed a $300,000 addition to the laboratory. With the completion of this newest addition the laboratory will have a total of 50,000 sq. ft. of floor space.

Dr. P. S. Williams is director of research for Carter.

Justice Department Expected to Lose California Suit, Bill Foe Says

WASHINGTON. — The Department of Justice initiated the California tidelands suit with the idea the Government would lose, and the Interior Department is playing further into the hands of the state and its lessees by holding the federal leasing laws do not apply to the submerged oil fields, Orin Demotte Walker, attorney for Robert E. Lee Jordan and other applicants for federal leases, told the joint Senate-House judiciary subcommittee March 15.

The subcommittee, in recess since March 9 because of the absence of Senator Forrest C. Donnell of Missouri, due to the death of his mother, resumed hearings this week with opponents of the legislation to return title to the state winding up hearings which began February 23.

Walker declared that California never held title to the tidelands, in the first place, because of restrictions placed by the federal Government on the lands to be turned over to the state when it entered the Union in 1850. In legislation dealing with the subject, he said, Congress provided that no lands should be granted the state until after they had been surveyed, and no survey ever has been made to the submerged lands.

Minerals Important

However, he said, the question of title is "really not vital, so long as the minerals, including gas and oil are reserved in the Government."

Jordan's application for lease covered areas in the harbor of Long Beach which would be held to be state land under the stipulation developed by the Department of Justice in which, he charged, "for the purpose of transferring the oil deposits of the State of California in those locations, the attorney general, by the simple expedient of a red pencil, drew a line on a map from near Point Fermin to a spot on the coast in the southeastern part of the city of Long Beach, and thought that by drawing this line he had created a bay and made it inland waters of the state."

"This action against California was brought, in my opinion, with the idea that it should be lost by the Government," Walker asserted, adding that by Jordan's efforts as "amicus curiae," the true facts were presented to the court and the suit was won.

Further, he said, once the oil was held to be owned by the Government, if the leasing act was held to apply the oil companies would be enjoined and California would lose the royalty.

"There was only one way to defeat the lawful applicant and protect California," he explained, "and that was by declaring the leasing act not to apply to deposits of minerals in public domain, which happened to be in submerged lands, and this is what was done by agreement between counsel for the Government, the Secretary of the Interior and the attorney general of California."

Walker suggested that "if the natural resources are to be quitclaimed, that all of the public lands in all of the states should likewise be quitclaimed, and we could then dispose of the Interior Department which would reduce government expense in a sizable amount."

He also called attention to California's failure to get a conservation act, and said "the oil companies in California operating under state and municipal leases have been as busy as cats, extracting all the oil they possibly could from the government-owned lands, knowing that it could not last long and they were going to get all they could while the getting was good.

"I firmly believe that this policy was adopted because California knew it had no title to the land being drained and no rights in the oil being stolen, but on which they have exacted royalties since 1938," he added.

Britain Plans Increase In Tanker Production

WASHINGTON.—Britain this year plans to construct 175,000 gross tons of tanker capacity as against 120,000 tons in 1947, it was disclosed last week by the British Information Services in an official summary of the British Government's economic survey for 1948.

An official of the BIS, however, said the 1948 target is purely tentative and its achievement will depend upon the allocation of steel under the Marshall plan.

The survey disclosed that for the first half of this year Britain expects to expend £47,000,000 on the importation of oil, of which £27,000,000 will be expended in the Western Hemisphere, £12,000,000 in the Sterling area, and £8,000,000 in other countries.

Imports for all of 1946 were valued at £60,000,000 and for all of 1937 at £75,000,000. The estimate covers only the first half of the year, because of uncertainty over what will be made available under the Marshall plan, but if imports for the whole year are at the same rate as proposed for the first 6 months, the total of £94,000,000 will not necessarily represent an increase in consumption over 1947, it was explained, because of the higher prices now prevailing and might actually reflect a reduction in consumption.

300,000-Bbl. Increase Made in Export Quotas

WASHINGTON.—A 300,000-bbl. increase in the export quota for crude petroleum for this quarter was announced by the office of international trade March 15, 3 days after the House rules committee refused right-of-way for consideration of the Heselton resolution calling for a 30-day embargo on exports.

The increase in the quota from 800,000 to 1,100,000 bbl., the OIT explained, was necessary to take care of hardship cases.

"Ordinarily," it was stated, "when new controls are announced exporters are given a period of grace within which they can ship without license. The imposition of controls on crude oil caught a number of shippers with supply contracts concluded and shipping arrangements completed, and severe hardship would have resulted if licenses had not been granted promptly.

Within 2 weeks after the announcement, 720,000 bbl. were licensed to take care of these hardship cases. Under these conditions it became apparent that the original quota of 800,000 bbl. was inadequate."

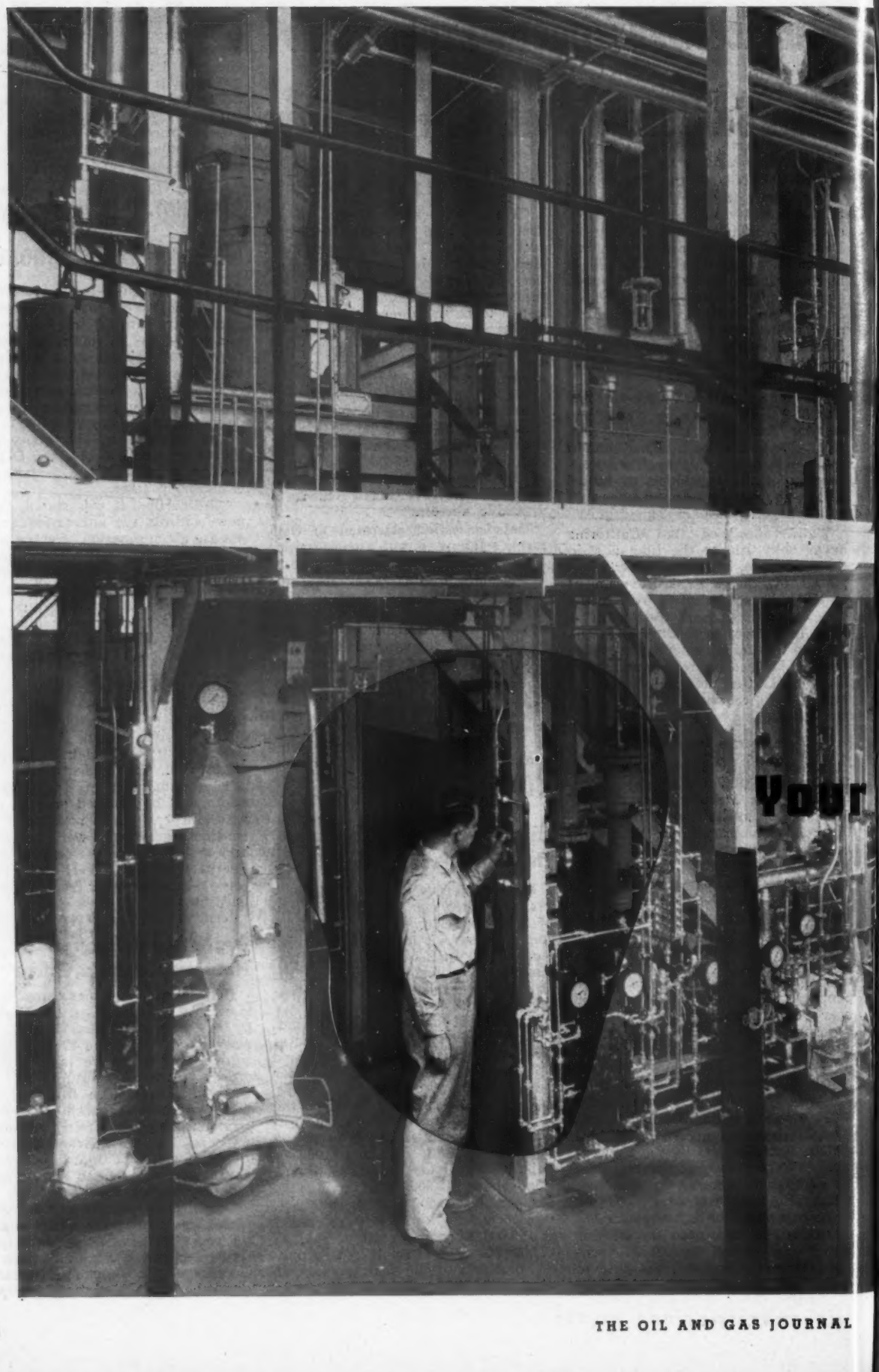
The remainder of the enlarged quota will be licensed only in cases where it can be demonstrated that contract agreements were completed and tanker charters arranged before February 20, and where failure to receive a license would result in undue hardship.

Argentina to Reopen Houston Consul's Office

HOUSTON.—Fulltime consular offices are being opened in Houston by the Argentine Government. The new consul, Valentine Luco Origone, is expected to arrive and establish offices in the near future.

Establishment of the Houston consulate follows a recent Argentine presidential decree closing all honorary consulates. T. L. Evans, president of the Houston Foreign Trade Association, has represented Argentina as honorary vice consul.

Carlos Meissner, former Brazilian consul, has returned to Houston after 2½ years service in the Ministry of Foreign Affairs in Rio de Janeiro. He succeeds A. J. Bezerra de Menezes who is being assigned to another post.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Casing Trades, Hoarding, Steel Exports Scored by Independents

CORPUS CHRISTI.—Trading of oil-well casing for pipe-line connections, stockpiling and hoarding of oil-country pipe, and use of oil-industry tubular goods and steel products outside the Western Hemisphere were condemned March 12 in resolutions passed at the second annual convention of the Texas Independent Producers and Royalty Owners Association.

The association voted to ask an investigation of some cases in which crude-oil purchasers have reportedly used oil-well casing to bargain for connections. Such deals, the association said, may violate state and federal antitrust statutes.

Stockpiling of pipe by "some major oil companies, some independents and individuals" was charged by the organization. This practice, it declared, prevents the small independent producers from obtaining their equitable share of available tubular goods.

War Being Talked

Opposing use of industry equipment outside the Western Hemisphere, another resolution declared that war with Russia is being openly discussed at the present time and said that, if war should come, all pipe lines, refineries, and well in the Eastern Hemisphere could, in the opinion of the association, be lost. The needs of national defense and the domestic economy would be served by using steel and tubular products for development of Western Hemisphere reserves, it added.

Several other resolutions were approved by the several hundred independent operators and royalty owners at the meeting. These placed the association on record:

In favor of the Moore-Rizley bills to amend the Natural Gas Act.

For use of a standard pressure base in measuring natural gas.

Acking the Senate foreign relations committee to make a new study of the Anglo-American oil agreement.

Against the announced intention of the federal Government to sue for Texas offshore lands.

In favor of secondary-recovery operations where appropriate.

Officers Named

Guy I. Warren, Corpus Christi independent operator, was elected president of the association, to take office in September succeeding H. J. Porter, Houston. E. O. Thompson, Austin, was reelected executive vice president, and W. T. Beard, Jr., San Antonio, and C. P. McGaha, Wichita Falls, were chosen treasurer and secretary, respectively.

The following were chosen vice presidents and executive committeemen:

L. A. Douglas and R. F. Schoolfield, San Antonio; C. K. McCan and J. P. Pool, Jr., Victoria; Ralph Johnston and Vernon W. Frost, Houston; Guy C. Jackson, Anahuac; M. M. Galloway, West Columbia; T. B. Hoffer, McAllen; Tom Graham and Maston Nixon, Corpus Christi; V. F. Neuhaus, Mission; R. L. Foree and Bert Fields, Dallas; Arch Rowan and C. J. Davidson, Fort Worth; Bryan Payne and W. C. Windsor, Tyler; J. J. Jenkins, Kilgore; Joe Mucher, Longview; W. E. Perini, Jr., and Edgar Davis, Abilene; Floyd C. Dodson and R. G. Carr, San Angelo; C. B. Lyman, Midland; E. G. Rodman, Odessa; A. R. Dillard and R. A. King, Wichita Falls; and A. E. Herrmann and Cecil O'Brien, Amarillo.

Speakers at the meeting included Ira C. Eaker, Houston, vice president of Hughes Tool Co., and Steve Stahl, executive vice president, Oklahoma Public Expenditures Council. Eaker, a retired lieutenant general who was chief of staff of the Army Air Forces during the war, discussed the elements of a sound national defense policy and warned that a Russian attack might be expected "when they think they can get a cheap victory."

Union Calls Strike Vote Among Sinclair Employes

The Oil Workers International Union last week took the first step in an attempt to enforce its demand for a general wage increase of 30 cents an hour.

O.W.I.U. President O. A. Knight called a nationwide strike vote for an estimated 10,000 employes of Sinclair Refining Co., the results to be announced April 15. Knight also advised company officials in a letter that the present working agreement will be terminated July 1.

The union, Knight said, will abide by its present working agreement, regardless of the outcome of the vote, until the agreement expires.

Decision to demand a general 30-cent increase was reached by the union's wage-policy committee in Fort Worth February 9.

Sinclair operates refineries at East Chicago, Ind.; Coffeyville and Kansas City, Kans.; Wellsville, N. Y.; Sand Springs, Okla.; Marcus Hook, Pa.; Sinclair, Wyo.; and Corpus Christi, Houston, and Fort Worth, Tex.

640-Acre Spacing Set For Madisonville Field

AUSTIN.—The Texas Railroad Commission has issued a temporary order requiring that wells in the Madisonville gas field, Madison County, be spaced 5,280 ft. apart and 1,320 ft. from the property line.

Olin Culberson, one of the three commission members, dissented from the order, contending that it was issued without substantial engineering evidence to support it. The ruling will result in 640-acre spacing in the field.

Bartlesville Presented First Oklahoma Well

The city of Bartlesville, Okla., last week acquired the 1 Nellie V. Johnstone, the state's first commercial oil producer which was completed April 15, 1897, for an output of 50 to 75 bbl. daily.

The deed to the well was presented to Mayor R. H. Hudson by Howard Cowden, president of Co-Operative Refinery Association, Kansas City. The city plans to develop the site as a state historical monument.

In presenting the deed Cowden pointed out that the historic well has produced more than 100,000 bbl. during the past 51 years. Present production of the well is now ½ bbl. per day.

Indiana Standard Cited By American Legion

Dr. Robert E. Wilson, chairman of the board of Standard Oil Co. (Ind.) last week was presented a citation by George Craig, national committeeman representing the American Legion, in appreciation of the benefits and considerations granted by the company to World War II veterans.

The American Legion cited the company for "pioneering in policies of reemployment, rehabilitation, and educational benefits" which have "contributed to current employment at the Whiting refinery of approximately 4,000 veterans."

French Fuel-Oil Stocks Show 66 Per Cent Drop

French fuel-oil stocks fell from 360,000 tons to 80,000 tons in the 7-month period from July 1947 to January 1948, a drop of more than two-thirds, according to reports in London. The decrease was due to insufficient refinery runs and restrictions on imports from dollar countries.

New members of the Magcobar *family of drilling mud products*

IN KEEPING with the Magcobar policy of providing the industry with a complete drilling mud service and the latest scientific developments in this field, we are proud to announce the addition of these proven oil mud products:

JEL-OIL, a ready-mixed straight oil mud, has a zero fluid loss which prevents water blocking in even the tightest low pressure sands. Jel-Oil has numerous applications — it is not seriously affected when drilling salt, anhydrite, lime and shale; the hole through all formations remains bit-size, and it contributes to a good cement job; it is a good lubricant, reducing rotary torque, circulating pressure and hole friction; bits last longer and fewer trips are required; and it is a valuable aid in obtaining unaltered cores.

VIS-CUTTER AND VIS-BOOSTER are chemicals for controlling properties of Jel-Oil Mud.

JEL-OIL "E," a ready-mixed emulsion compound which is easily added to conventional muds to give a stable oil emulsion mud, reduces torque and circulating pressure, speeds drilling, makes bits last longer and cuts down the number of trips. It also prevents hole trouble and water blocking of pay sands. Emulsion mud is low in cost.

"E" CONCENTRATE, an emulsifying and stabilizing agent in concentrated form, is mixed with diesel oil at the well for making emulsion muds. It effects economies in transportation and storage for isolated operations.

The composition of JEL-OIL and JEL-OIL "E" and their application in drilling are fully covered by licenses under patents held by the Shell Development Company and Halliburton Oil Well Cementing Company.

MAGNET COVE BARIUM CORPORATION

MALVERN, ARKANSAS HOUSTON, TEXAS

Export Representative: Guy E. Daniels, 30 Rockefeller Plaza, New York, N. Y.

WASHINGTON WATCHING

BY BERTRAM F. LINZ

Just as Expected

WASHINGTON.—Sen. Kenneth S. Wherry of Nebraska means well and has done a good deal toward forcing certain reluctant elements in the oil industry to adopt the practice of distributing their products equitably, but apparently he didn't know what the gun was loaded with when he triggered his suggestion that the Connally Hot Oil Act should be suspended and state proration lifted.

The idea apparently was worked out by Paul Hadlick, special counsel to Wherry's small business oil subcommittee, to break the "four-legged platform"—Connally Act, Interstate Oil Compact, state proration laws, and Bureau of Mines demand forecasts—which he said the large oil companies built to control the industry.

The response to Wherry's suggestion has been just what might be anticipated. An overwhelming majority of oil producers have been sharply critical, but a few who like the idea of quick money have applauded, and a great deal of support from independent distributors who have hopes it would bring enough new oil into the market to break the present jam.

Wherry, himself, continues to hammer at the idea. His contention is that it would bring out enough oil to permit the independent refining industry, which he says now is working at less than 70 per cent of capacity, to get back into full operation. And, he says, it could be done without violating conservation practices.

But so far, no government official concerned in any way with oil has come out publicly in approval of the proposal.

Theory Debunked

A LOT of suggestions for safeguarding the domestic economy against the impact of heavy oil exports under the Marshall plan have been put under the microscope by the staff of the Senate foreign relations committee, but none appears to have been found workable.

The committee's studies developed that no special provisions respecting oil or other items in short supply were included in the original bill submitted to Congress by President Truman. The bill under consideration by the Senate, however, calls for preservation of our economic equilibrium, avoidance of impairing the vital needs of our people and the principle of getting oil elsewhere as far as practicable and of not encouraging petroleum consumption abroad. Another bill, prepared by Rep. Christian A. Herter of Massachusetts after House committee hearings, states as a main policy the prevention of undue strain on the United States economy and calls for participation of other countries as helpers in the program.

A recent report by the staff notes that the idea of seeking oil elsewhere was embodied in the interim-aid bill enacted last year, which also directed that petroleum procured elsewhere should be delivered to the recipient by the most economical route.

"This condition should not be included in the present legislation," the report recommended. "Its only discoverable effect is to tie up administration with endless proof to the General Accounting Office. It is incompatible with the other provisions of the act seeking to get away from red tape."

The idea of getting other countries to go along, included in the interim-aid act, the staff also held, "has not been productive of any help."

The report pointed out a number of related suggestions were brought up during debate on the interim-aid act.

One would ban oil shipments unless the Secretary of Commerce certified they would not hurt the defense of the United States or civilian use in this country. "Decrease of United States shipments to Europe would merely mean diversion from elsewhere to Europe and thus reduce petroleum coming into the United States," it commented.

Another would ban shipments of items in short supply, and "would be equivalent to striking the enacting clause," and a third, to ban the shipment of farm machinery and petroleum products, "cuts across the purpose of getting European agriculture back on its feet."

Other suggestions which the committee staff noted, without comment, would authorize the Interior Department to engage in exploration for, and development of, new sources of oil, and would provide for domestic controls on items in short supply.

It's No Good

THE Japanese refining industry is so inefficient that a commission which recently made a survey of Japanese reparations possibilities suggested it be thrown away.

With a production of probably less than 4,000 bbl. a day, Japan before the war had a total refining capacity just short of 100,000 bbl. daily. Some 72,650 bbl. of this capacity was damaged beyond repair by American attacks, and of the remaining 26,870 bbl., 16,770 is operating and 10,100 is capable of repair.

None of these plants is modern in the light of present-day practice in the United States or elsewhere; none is a cracking plant; all are relatively small, inefficient skimming plants, varying in capacity from 600 to 5,000 bbl. daily, but owing to shortages of crude none is being operated at or near capacity and even if sufficient crude were available, the obsolete methods followed and the apparent lack of modern technical knowledge in management would seem to preclude the possibility of efficient operation as judged by up-to-date standards, Secretary of the Army Kenneth C. Royall was told in the commission's report.

Japanese drilling methods and equipment are modern in most respects, but exploration methods are subject to improvement. It was suggested that a modern geophysical survey be made and if sufficient oil is found one or two modern refineries built to process it.

Failing discovery of adequate supplies, however, it was recommended that all crude produced, now running around 3,600 bbl. daily, be exported and refined products imported, and in any event that all present refineries be scrapped.

As a matter of fact, it was held, it would be more economical for Japan to sell its crude to Dutch East Indies refiners or exchange it for products which undoubtedly would have a greater value than the products from the same amount of crude if put through wasteful Japanese refineries.

Getting Ready for War

IF another war comes it may find the United States, for the first time in its history, fully prepared for quick mobilization of its military and industrial strength.

At any rate, that is the objective of the National Security Resources Board, and to pave the way for the planning of mobilization the board now is setting up some 20 divisions dealing with as many subjects, including a petroleum division which, when organized, immediately will initiate studies of our current and prospective future supply position, the requirements of a wartime economy, and how those requirements can be met.

In making these studies, the board not only will call upon all federal agencies dealing with oil for such information and recommendations as they may have, but will enlist the cooperation of the industry, consulting

individuals, companies, trade associations, and research organizations.

None of the divisions, all of which will make similar studies in their own fields, will be very large, the plans for the petroleum division calling for possibly as few as five or six persons. Its main task, after securing all the information available, will be to prepare a report for the board, recommending what steps may best be taken to insure an adequate supply of oil in the event of war. Those recommendations may call for one or another of the proposals made recently by government officials—stockpiling, quick synthetics development, or peacetime restrictions on civilian consumption to conserve supplies—or may strike out in some entirely new direction.

The board plans to call on the industry to send men to Washington to serve in the division for short periods so that, in the event of an emergency, it can build overnight the personnel needed for wartime administration.

The board is attempting to avoid two things which have handicapped us in getting ready to fight in all previous wars. One of these is the delays in getting full control of the industrial and civilian economies into effect, and the other is the development in peacetime of mobilization plans which are then "frozen" and are found to be totally deficient when the time comes to put them into operation.

Industry Says Yes

WITH the increasing difficulty of raising money in the present capital markets, industry, deeply concerned over the lack of capital for plant improvement and expansion in new enterprise, is solidly supporting the tax legislation now pending in the Senate, which they believe would give taxpayers in the upper income brackets sufficient surplus so they could invest in venture capital.

There is, however, considerable doubt that the Senate will accept the tax cut of more than $6,000,000,000 sought by Rep. Harold Knutson of Minnesota in legislation already passed by the House, since congressional leaders see definite possibilities that the budget may have to be increased over the next year or two because of the foreign situation, rather than reduced.

Industry advocacy of extensive tax cut is premised on the contention that the main consideration to be borne in mind is not how much the Government will give abroad but the necessity of keeping our domestic economy running smoothly so we can do what needs to be done.

It is argued that there is plenty of room for economy in government operations which could be translated into tax reductions which would release money for risk investment in the oil and other industries which must be greatly expanded if domestic and foreign requirements are to be met.

A recent count is claimed to have shown there are now 1,141 separate bureaus and agencies of government, leading to the conclusion there undoubtedly exists a considerable overlapping and duplication of activities which could be eliminated with beneficial results to both taxpayers and business.

Synthetic-Fuels Bill Is Signed by Truman

WASHINGTON. — Legislation extending the Bureau of Mines' synthetic-fuels research program for an additional 3 years and doubling the appropriation for the work, to $60,000,000, was signed by President Truman March 15.

The measure carries a provision not in the original legislation, earmarking $1,000,000 for research in secondary recovery.

Elk Hills Hearing to End Military Supply Study

WASHINGTON.—The House armed services oil subcommittee plans to wind up its investigation of petroleum supplies for the armed services this week with a final hearing on the Elk Hills naval oil reserve.

The subcommittee wants to get additional information on developments with respect to expansion of the reserves, which was the subject of inquiry at one of its hearings last month.

The Navy Department has asked that the reserve limits be moved so that it may determine the extent of oil pools which go beyond the present boundary, and Standard Oil Co. of California and others having interests in the area are opposing the plan.

Appalachian Research Station Requested

WASHINGTON. — Legislation authorizing an appropriation of $1,000,000 for establishment of an experiment station in the Appalachian region for research by the Bureau of Mines on production, refining, transportation and use of petroleum and natural gas was urged by Interior Department officials last week at hearings before the House public lands committee.

Acting Secretary Oscar L. Chapman explained the proposed station would supplement but not supersede the present bureau station at Franklin, Pa., and would develop through research valuable contributions to conservation. Maintenance and operation of the station would cost $500,000 a year, it is estimated, and a move is on foot to locate it in the Oil City area of Pennsylvania.

The committee also has before it a bill introduced by Rep. Thomas A. Jenkins of Ohio calling for construction in the Hocking Valley region of a station for research on the production, refining, transportation, and use of oil and gas from coal and oil shale, for which he is asking $1,000,000 and an operating fund of $100,000 a year.

Southeastern Oil Gets Fourth Tanker for Fleet

The fourth tanker of the Southeastern Oil, Inc., fleet which was purchased recently for $3,500,000, from the U. S. Maritime Commission, has been delivered to the company. The tankers will be used to transport petroleum supplies from United States and Mexican sources in the service of the company's domestic and foreign business.

Southeastern operates principally along the East Coast from terminals at Tampa, Miami, Jacksonville, Savannah, Charleston, S. C., and Wilmington, N. C.

Continental Announces New Cost of Living Bonus

Continental Oil Co. has introduced a new cost of living bonus for salaried employes, ranging from $17.50 to $40 monthly, effective March 1.

The cost of living bonus previously in effect was added to the employe's regular salary, and this sum became the new base salary. Employes receiving $15,000 or more do not participate in the bonus.

Safety Publications Index Listed by Bureau of Mines

More than 1,600 publications on health and safety in the mineral and allied industries, prepared in the Bureau of Mines during the past 28 years, are described briefly in a bibliography issued by James Boyd, bureau director. It is the first separate listing of publications in this field since the bureau was created in 1910, and includes brief synopses of all of them except a few with self-explantory titles.

Copies may be obtained only from the Superintendent of Documents, Government Printing Office, Washington, D. C., price 30 cents.

Jersey Standard Tankers Will Get Radar Sets

Standard Oil Co. (N.J.) has placed contracts for the installation of radar sets on 40 of its sea-going tankers. Twenty radar sets are being purchased from Radiomarine Corp. of America and Sperry Gyroscope Co.

PERSONALS

Gulf Coast Executive Was Geological Scout

AMONG the group of younger executives in the Stanolind Oil & Gas Co. organization is R. E. Nelson, Jr., recently made manager of the company's Gulf Coast division with headquarters in Houston.

Nelson entered the oil business via a major in geology at the University of Missouri, Columbia. His first job was with Sinclair Oil & Gas Co., and during about a year with Sinclair he scouted the discovery well in Oklahoma City field in 1928. In 1929 he joined Dixie Oil Co., the old producing subsidiary of Standard Oil Co. (Ind.).

With the organization of Stanolind in 1931 out of Dixie and several other companies, Nelson became a geological scout in West Texas. In 1935 he was sent to Houston as landman, and 2 years later he was made district landman in Amarillo. In 1941 he was named assistant division landman in the West Texas-New Mexico division, Fort Worth.

Nelson was shifted to Stanolind's general headquarters in Tulsa in 1943. There he assisted in the organization of the company's department of unitization, now headed by Whitney Elias as superintendent, and later was promoted to executive assistant to the director of producing and manufacturing. In the latter part of 1947 he was sent by the company to Harvard, where he took the course in advanced management in the university's Graduate Business School.

Nelson is a native of Missouri. He attended high school in Okmulgee, Okla., and Central College, Fayette, Mo., before entering Missouri University. In his new job in Houston, he is in over-all charge of the company's operations throughout the Texas and Louisiana Gulf Coast, including three exploration and four producing districts. His appointment January 1 to the Gulf Coast position, along with other managers in the West Texas-New Mexico, Rocky Mountain, and central Mid-Continent areas, was a part of what E. F. Bullard, Stanolind president, described as a program of expansion and decentralization of company operations.

Fred Damon, formerly with Phillips Petroleum Co., has opened a district office in Shawnee, Okla., for MacMillan Petroleum Corp., Los Angeles.

A. Paul Callahan, formerly petroleum engineer for The Texas Co. in the Drumright and Seminole areas of Oklahoma, has joined Sohio Petroleum Co. as petroleum engineer for the West Edmond Hunton Lime Unit at West Edmond.

H. G. Burks, Jr., formerly manager of the East Coast refineries for Esso Standard Oil Co. and a director of

H. G. BURKS, JR.

H. W. FISHER

the company, has been appointed general manager of the company's manufacturing operations. During the war Burks served as chairman of the technical group of the refining committee District 1 and chairman of the aviation gasoline advisory committee of the Petroleum Administration for War. **H. W. Fisher,** director of Esso and president of Enjay Co., Inc., a subsidiary of Standard Oil Co. (N. J.), which markets petroleum chemical products, has been named to succeed Burks.

James A. Stone, inspecting engineer, and **Pieter Root, Jr.,** test engineer, both in the Pacific Coast branch of the American Gas Association Testing Laboratories, have been promoted to chief inspection engineer and assistant chief testing engineer respectively.

P. S. Ervin, formerly chief petroleum engineer, minerals division, Louisiana Department of Conservation, and chief petroleum engineer, Haynesville Operators Committee, has become associated with **Frank N. Speller, Jr.,** petroleum engineer, Tyler, Tex., as reservoir engineer.

David N. Hauseman, formerly executive vice president of Temple University, Philadelphia, and president of the Research Institute of the university, has been elected president of Houdry Process Corp., Philadelphia. Hauseman succeeds **Eugene J. Houdry,** founder of the company, who has retired. Under a new policy the board of directors of Houdry Process will be made up exclusively of men working in the company. Newly elected directors besides Hauseman are: **Arthur V. Danner,** executive vice president; **Claude C. Peavy,** chief engineer; **John E. Ford,** manager of commercial development; **Gordon A. Kessler,** manager of patent department; **C. G. Kirkbride,** manager of laboratories; **T. Ellwood Webster,** president of Catalytic Construction Co.; **George H. Daft,** comptroller; and **John D. M. Hamilton,** secretary and general counsel.

D. N. HAUSEMAN

Albert G. Kulp, Tulsa attorney and former counsel for American Airlines, has been appointed general counsel of Oklahoma Natural Gas Co.

E. G. Flowers, attorney, has joined McCarthy Oil & Gas Co., Houston, to assist **A. G. McNeese, Jr.,** general counsel.

L. T. Tier, formerly geologist for Continental Oil Co., at Wichita Falls, Tex., has been placed in charge of the new North Texas division office of Anderson-Prichard Oil Corp. in Wichita Falls.

H. A. Trower, vice president of Phillips Petroleum Co., Bartlesville, Okla., has been elected president of Wasatch Oil Refining Co. Trower succeeds **Henry D. Moyle** who was named chairman of the board of directors.

George Kelso, formerly manager of the technical service and plant operations division of Houdry Process Corp., has joined **V. L. Sanderson.**

PERSONALS

They will act as sales engineers of equipment for the petroleum and chemical industries for a manufacturer in the Philadelphia area.

A. I. LEVORSEN

Arville Irving Levorsen, geologist and head of the School of Mineral Sciences at Stanford University, California, has been named recipient of the Sidney Powers Memorial Award of the American Association of Petroleum Geologists. The award, which is given "in recognition of distinguished and outstanding contribution to, and achievements in, petroleum geology," will be conferred at the annual meeting of the A.A.P.G. in Denver April 27. Levorsen previously was an independent research geologist in Tulsa.

Hugh D. Miser, geologist of the United States Geological Survey, Washington, D. C., has been elected to honorary membership in the A.A.P.G., the highest membership honor in the association. He has had charge of the survey's sections of areal geology and the geology of fuels. Miser, a graduate of the University of Arkansas, joined the survey in 1907. He has previously served as state geologist of the Tennessee Geological Survey and the Arkansas Geological Survey.

Louis Michelson, geologist, has joined Texas Gulf Producing Co. in the Midland, Tex., division office. **Floyd Littlejohn,** of Houston, has been named assistant to **Tod Williams,** production superintendent of the company's Permian Basin area at Odessa, Tex.

J. C. Denney, former civil engineer for Humble Oil & Refining Co. in the North Government Wells district, Southwest Texas division, has been made district civil engineer. **L. H. Byrd,** district petroleum engineer, Hawkins district, East Texas division, has been promoted to assistant district superintendent of the London district. Other recent changes in Humble's production department: **W. B. Ewing,** assistant district superintendent, London district, East Texas division, to district superintendent at Pruitt; **C. N. Hunt,** former farm boss, London district, to assistant superintendent, Wink district, West Texas division; **C. E. Stanley,** superintendent, Pruitt district, transferred to the Thompsons district, Gulf Coast division; **H. W. Roberson,** superintendent, Navarro Crossing district, East Texas division, transferred in the same capacity to a Gulf Coast division to be announced later; **C. M. Boatman,** farm boss, McCamey district, to assistant superintendent, Hobbs district, West Texas division; **C. C. McNeil,** farm boss, Wink district, to assistant superintendent, Wasson district, West Texas division; and **P. M. McFadden,** assistant superintendent, Hobbs district, transferred to the McCamey district, West Texas division.

Walter Wagner, Arabian American Oil Co., is being transferred from San Francisco to New York where he will be in charge of purchases of materials outside the world's dollar area. **Richard Backman,** who has handled this position, will return to San Francisco.

H. C. McDonald, district engineer for United Gas Pipe Line Co. in San Antonio, has been promoted to district pipe-line superintendent. McDonald, who has been with United Gas and predecessor companies since 1924, will be succeeded as district engineer by **J. J. Koy,** with United Gas since 1930. **W. J. Fitzgerald,** landman in the Tyler, Tex., district for Union Producing Co., another United Gas Corp. subsidiary, has been made district landman.

I. H. McVicker, division superintendent for Stanolind Pipe Line Co., headquartered at Bowie, Tex., will have his territory extended to include main lines and stations in the Central and East Texas area south to Mexia station, Mexia, Tex. **J. J. Dougherty,** division superintendent, headquartered at Tomball, Tex., will have his territory extended to include main lines and stations in the Central and East Texas area north to include Mexia station, Mexia, Tex.

Officials of the producing department, The Texas Co., gathered in Houston for the annual producing committee meeting the week of March 8th and mapped the operating program for the year. In the group are (seated) L. A. Scholl, Jr., Houston, manager, geophysical division; F. C. Sealey, New York, general manager, foreign producing department; R. F. Baker, New York, general manager, producing department, who is vice chairman of the producing committee; L. E. Barrows, Houston, consultant; J. T. Wood, Jr., Los Angeles, manager, Pacific Coast division; G. Herzog, Houston, director of research, producing department laboratory; C. B. Williams, Fort Worth, manager, West Texas division. (Back row) W. V. Vietti, assistant to the manager, producing department, and manager of the gas division; H. A. Stewart, Denver, manager, Rocky Mountain division; W. C. Kneale, Houston, manager, South Texas division; A. R. Wilson, Houston, assistant manager, producing department; E. P. Hayes, Houston, chief petroleum engineer; J. C. Brooks, Houston, department agent; M. J. Heald, Tulsa, manager, Oklahoma division; J. N. Troxell, Houston, assistant manager—departmental geologist, producing department; R. L. Keyes, New Orleans, manager, Louisiana division; V. L. Porter, Houston, assistant to the manager, producing department; W. J. Hanley, New York office, producing department; and E. R. Filley, Houston, manager, producing department. R. Ogarrio, New York, vice president in charge of the producing department, who is chairman of the committee, was not present when the photograph was made

Robert M. Williams, landman for Sohio Petroleum Co. in Oklahoma City, has been transferred to Wichita to succeed **F. W. Simms,** who has resigned to join Buffalo Oil Co. at Dallas.

Dick Short, Continental Oil Co. geologist at Alice, Tex., has been transferred to the San Antonio office where he will direct subsurface exploration in Southwest Texas.

Frank R. Roach, production superintendent of Cia. de Petroleo Shell de Colombia, is on a business trip in the United States.

Ralph D. Lowe, vice president in charge of sales, Elk Refinery Co., has been named president of the West Virginia Petroleum Association. He succeeds **C. W. Cooper,** Pure Oil Co.

Granville Tierney, formerly landman for Amerada Petroleum Corp. in Jackson, Miss., and recently in Wichita, has resigned to join an independent firm at Wichita.

Drillers who have been promoted to drilling foremen for Shell Oil Co., Inc., in the Pacific Coast territory include: **Roy V. Mahaffey,** Long Beach; **Edward P. Mooney,** Ventura to Long Beach; **Leo L. Sargent,** Ventura; and **Wallace C. Thompson,** Ventura. **Ralph E. Ashbaugh,** drilling foreman at Long Beach for Shell, has been transferred to Bakersfield; and **Paul D. Martin,** driller at Long Beach, has been transferred to Ventura.

H. E. White, assistant area superintendent, Texas-Gulf, for Shell Pipe Line Corp., has been named division superintendent at Healdton; **W. R. Simmons,** station engineer, Courtableau, has been transferred to Fannett.

Leo J. van Dijk, technical adviser for Asiatic Petroleum Corp., left New York last week for Buenos Aires, and to visit other Latin American countries.

Jack L. Penick, scout with Standard Oil Co. of Texas, has been promoted to geologist in the company's Corpus Christi office.

D. M. Glenn, who joined United Gas in 1927, has been promoted from field superintendent to district pipeline superintendent at Wichita Falls, Tex. **D. G. Hughes,** formerly section foreman with the company, has been made district pipe-line superintendent at Dallas.

E. R. Branson, formerly Michigan district geologist for Carter Oil Co., Tulsa, with headquarters in Mount Pleasant, Mich., has resigned to become vice president in charge of exploration for Turner Oil Corp., Mount Pleasant. Branson had been in the geological department for Carter since 1934. **Norman Stewart,** geologist for Carter, is temporary acting head of the Michigan division since Branson's resignation.

SHIFTS—

W. Wieske, engineer, Shell Oil Co., Inc., Hobbs, N. M., to McCamey, Tex.; **Laurie M. Sloan,** engineer, Humble Oil & Refining Co., Lolita to Bellville, Tex.; **E. F. Fullen,** superintendent, Pan American Production Co., Kountze to Kilgore, Tex.; **George W. Smith,** foreman, Continental Oil Co., Texon to Best, Tex.; **Vernon T. McGhee,** engineer, Phillips Petroleum Co., Alvin to Houston, Tex.

Herbert A. Babione, geologist, Humble Oil & Refining Co., Kingsville to Pleasanton, Tex.; **W. C. Abel,** superintendent, J. R. Sharp Drilling Co., Kermit to Levelland, Tex.; **Thomas B. Lambert,** engineer, Shell Oil Co., Inc., Midland to Odessa, Tex.; **Cecil P. Gladden,** superintendent, Cities Service Oil Co., Odessa to Iraan, Tex.; **D. P. Van Duym,** engineer, The Texas Co., Sundown to Wichita Falls, Tex.; **Charles H. Ise,** geologist, Sinclair Prairie Oil Co., Wichita Falls to Midland, Tex.

F. W. Briggs, foreman, Continental Oil Co., Plain Dealing to Bossier City, La.; **Kenneth A. Harper,** engineer, Cities Service Refining Co., Lake Charles, La., to Duncan, Okla.; **Theodore J. Bode,** engineer, Sinclair Refining Co., Homewood, Ill., to Alhambra Park, Calif.; **Wayne C. Jenkins,** foreman, California Co., Brookhaven, Miss., to Ruston, La.; **M. J. Millet,** foreman, The Texas Co., Hattiesburg to Brookhaven, Miss.; **R. C. Williams,** foreman, Stanolind Oil & Gas Co., Oklahoma City to Chandler, Okla.

DEATHS

Edward J. Gorman, 67, retired general manager of the Oklahoma and Kansas district for Sun Oil Co., died March 15 in Tulsa. Gorman had served as vice president, a member of the board of directors and general manager for the company. He retired in 1944 after 27 years of service.

Rollin Thomas Chamberlin, 66, professor emeritus of geology at the University of Chicago, died March 6 in Chicago. Professor Chamberlin, considered one of the world's greatest geologists, was a former vice president of the American Association for the Advancement of Science and of the Geological Society of America, and had been editor of the Journal of Geology since 1928.

C. A. Dorn, 82, independent operator throughout the Mid-Continent from 1907 until 1920, died March 10 in Denver. Dorn, originally from Bradford, Pa., moved to Oklahoma in 1907 and was active in the Mid-Continent until his retirement in 1920.

R. W. Robinson, 64, vice president of United States Asphalt Corp., died March 7 in Fort Worth.

Allen H. Pettigrove, 60, pioneer drilling contractor and independent oil operator of Oklahoma, died March 9 in Tulsa.

George B. McBride, 85, retired driller and independent producer of Pennsylvania, died March 11 in Seneca, Pa.

Kenneth N. Cook, assistant sales manager of Rollway Bearing Co., Inc., Syracuse, N. Y., died March 5. He had been with Rollway Bearing since 1927.

George Stuart Laing, 69, retired president and former director of West India Oil Co., a subsidiary of Standard Oil Co. of New Jersey, died March 6 in White Plains, N. Y. Laing, a graduate of Cornell University in engineering, was associated with Standard of New Jersey for 26 years and served as president of West India Oil Co. from 1935 until his retirement in 1939.

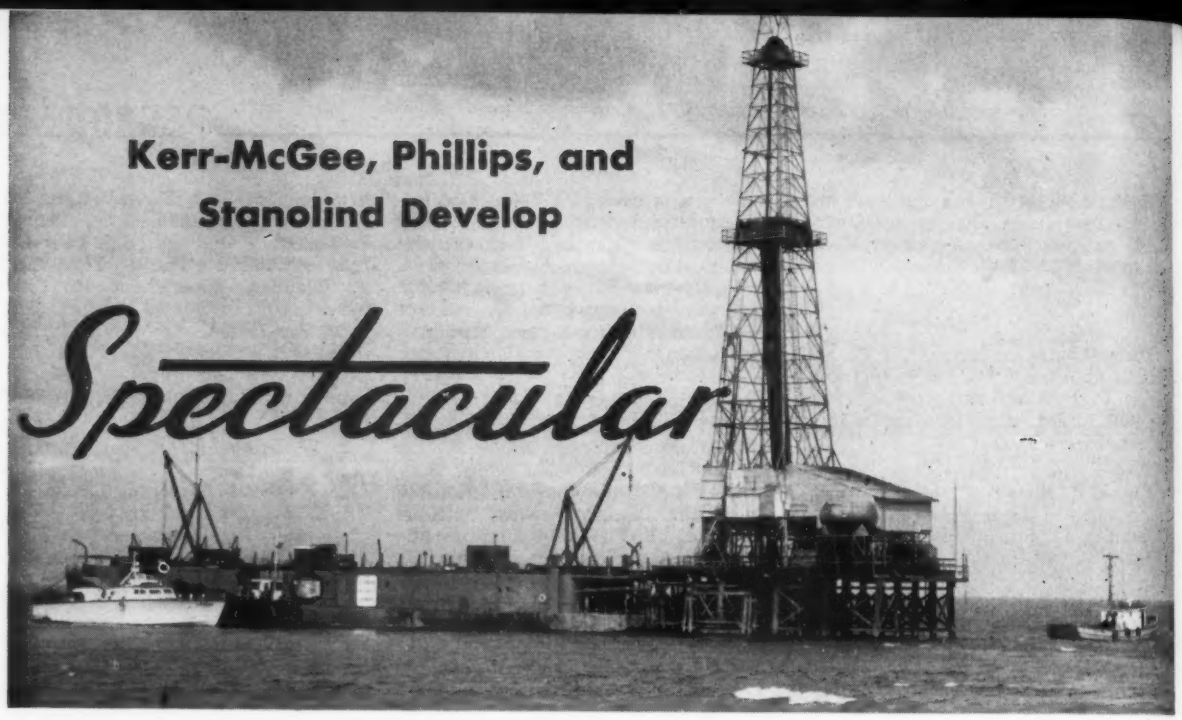
Charles Heeter, oil producer and manufacturer of Pennsylvania, died March 9 in Butler, Pa. Heeter was owner of Colonel Heeter Gas Co., Saxonburg, Pa., and was associated with several other firms.

M. S. Mussellem, 76, retired oil operator and a pioneer in developing Brushy Mountain pool southeast of Muskogee, Okla., died recently in Muskogee.

E. J. Swearingen, 55, independent oil producer of Shreveport, died March 12 in Shreveport.

John M. Danman, vice president of the Kansas Independent Oil and Gas Association, died recently in Sedan, Kans.

W. C. Phillips, Crockett, Tex., oil operator, died March 4 in Crockett.



Kerr-McGee, Phillips, and Stanolind Develop

Spectacular Gulf of Mexico Discovery

by Kenneth B. Barnes and Leigh S. McCaslin, Jr.

DESPITE the California tidelands-case decision, three aggressive operators—Kerr-McGee Oil Industries, Inc., Phillips Petroleum Co., and Stanolind Oil & Gas Co.—are moving full speed ahead in the development of their two 20,000-acre lease blocks lying in Louisiana coastal waters some 85 miles southwest of New Orleans.

The three companies, with Kerr-McGee as the operator, have to date accomplished the following in their ambitious program (Kerr-McGee 12½, Stanolind 37½, Phillips 50 per cent interest):

1. Hit a good commercial 900-bbl.-per-day well at 1,700 ft. with their first exploratory test, possibly proving as much as 100,000,000 bbl. of reserves in one zone alone. This is the first producing well in the world really out of sight of land (10 miles).

2. Started rigging up specially designed shallow-depth equipment for the drilling of directional wells from the platform used for the discovery test.

3. Started a second test on another promising-looking seismograph "high" 8 miles to the east of the discovery well, and on a deep-seated salt dome.

4. Designed and bought pipe for a 25-mile, $500,000 marine pipe line to bring the crude ashore.

5. Assembled a fleet of 16 boats and barges with the finest of modern high-frequency radio communications to connect the fleet with shore offices and drilling operations at sea.

6. Developed a revolutionary type of drilling equipment for use in unprotected waters.

Kerr-McGee's interests in offshore oil dates back to 1938 when the company did its first water exploration in Mobile Bay. Again in 1944, the company leased the east half of the Mississippi Sound totaling around 400,000 acres. However, in both of these initial endeavors seismograph work failed to find any prospective oil structures and the leases were dropped.

Reflection seismograph work was started off the coast of Louisiana in March 1946, and in August 1946 the

The Oil and Gas Journal engineering editors Barnes and McCaslin and photographer Bob Hawks traveled 1,500 miles by plane, train, rent-a-car, taxicab, company automobile, and water cruiser to cover this latest Gulf of Mexico offshore drilling operation and development program. Shown here at Dallas' Love Field is the Kerr-McGee party alongside the company's DC-3.

Land headquarters for Kermac's Gulf of Mexico operations is this equipment yard, office, radio center, and docks located at Berwick, La., 25 miles up the Atchafalaya River

. . . . . Possible 100-Million-Barrel Field — 10 Miles at Sea

company was high bidder on two lease blocks totaling 40,000 acres in the open waters of the Gulf of Mexico. These blocks are each 20,000 acres in extent and lie 9 to 11 miles from the nearest land—offshore from Point au Fer, Terrebonne Parish. For these two blocks Kerr-McGee paid the State of Louisiana a bonus of $317,000 and in addition agreed to pay an annual rental on the blocks of half the amount of the bonus until such time as drilling operations were commenced or the 5-year leases expired.

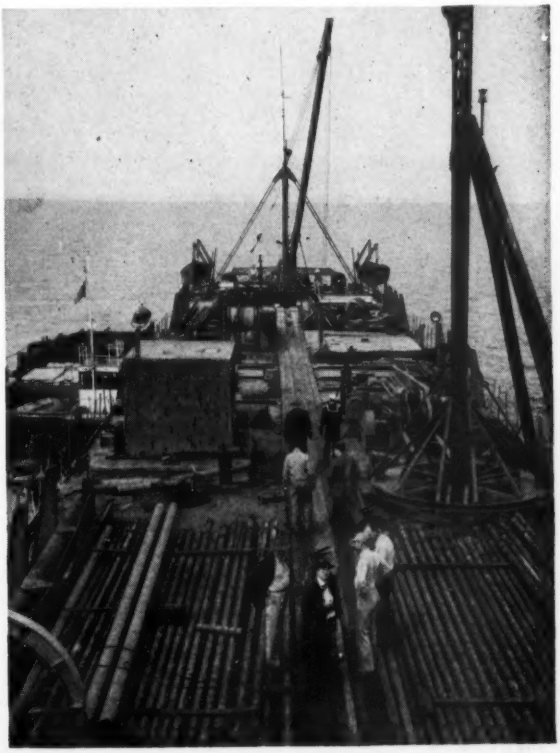
June 1947—the month the California tidelands decision was handed down by the Supreme Court—found Kerr-McGee with drilling platforms under construction on both the 20,000-acre leases, Blocks 28 and 32. This, plus the fact that the first annual rental date was September 12, prompted the operator to go ahead with the drilling of the wells despite the tidelands decision.

For the Block 32 well, the company engineering staff had designed a revolutionary new type of marine-drilling equipment—utilizing the combination of a war-surplus Navy barge and a 38-by-71-ft. platform. The well was spudded on September 9, 1947, and a little over 2 months later it had discovered 178 ft. of good pay sand underlying the Gulf of Mexico at a depth of 1,510 to 1,786 ft. On November 17, 1947, the well flowed a green, sweet, 25.3°-A.P.I.-gravity oil through a ½-in. tubing choke at a rate of 900 bbl. daily through perforations at 1,734-50 ft., total depth 2,568 ft.

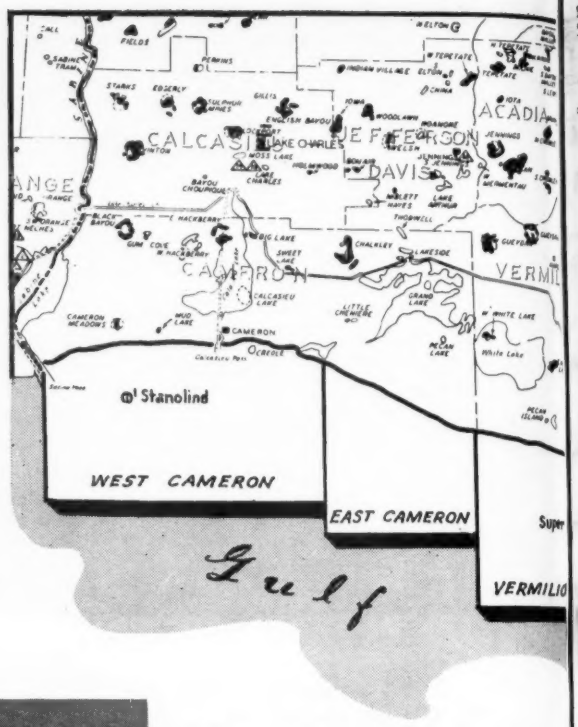
Very Favorable Sand Conditions

The Kerr-McGee et al shallow Block 32 oil discovery on the basis of a one-well "guesstimate" has indications of being a major pool solely from the one oil zone so far tested. Reservoir characteristics are extremely favorable with an average porosity of 30 per cent of the effective pay and a permeability so high in several sand sections that the permeameter used for testing did not have a sufficiently high range to record the permeability although it read to 24,000 md. A permeability of 24,000 would be approximately 10 times that of the best-known Wilcox sand pay section in Oklahoma City field. Three sands

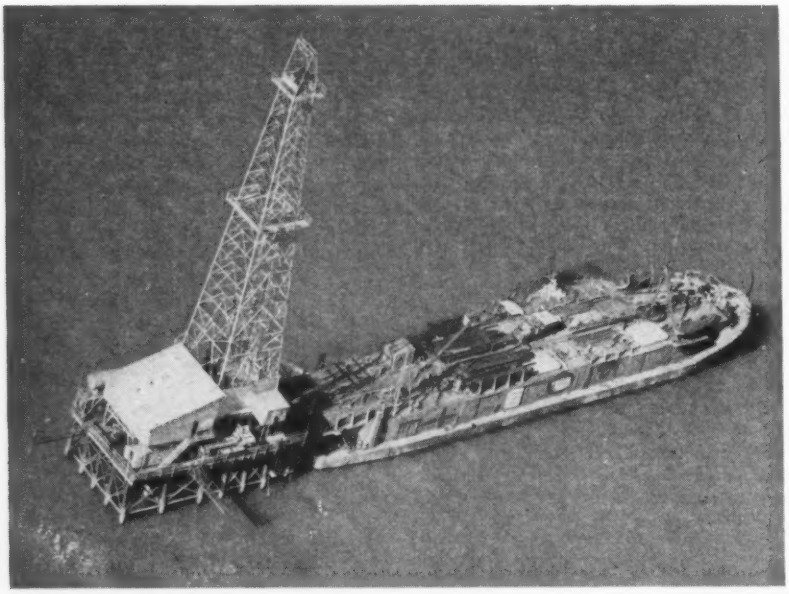
Right: Top of the 260-ft. long drilling barge, "Frank Phillips," as seen from derrick floor. Below: Dean A. McGee, executive vice president of Kermac, easily contacts Berwick headquarters from the barge 9 miles offshore via radio-telephone



Above: Kerr-McGee personnel gather around the huge company insigne painted on the drilling barge. (See aerial view below.) Shown here are: Tom Seale, chief engineer; W. F. Baxter, Gulf Coast drilling superintendent; Dean A. McGee, executive vice president; D. W. Lindsay, transportation superintendent; George Cobb, general production superintendent, and Jim Sheeley, steward



Above: In these 13 offshore areas Continental, Magnolia, Shell, Humble, Stanolind, Pure, California, Superior, Texas Co., Pan American, Seaboard, Kerr-McGee, Barnsdall, Union of California, and Sohio, have paid bonuses exceeding $15,000,000 to the State of Louisiana for 2,000,000 acres in oil leases. In the land areas on the Journal map are shown the oil and gas fields and salt domes of Southern Louisiana



were electrically logged in the interval between 1,510-1,786 ft. and their total effective pay thickness is 178 ft. This zone is very young—either Pleistocene or Recent in age.

The seismic shooting picture for Block 32 is reported to indicate the possibility of perhaps 600 productive acres above water table of the productive interval. Using a recovery estimate of 1,000 bbl. per acre-foot, for the productive conditions based on a water drive, the ultimate recovery easily could be 178,000 bbl. per acre. Assuming the above figures prove to be correct, the structure as indicated would have a possible reserve of 106.8 million barrels—a major field.

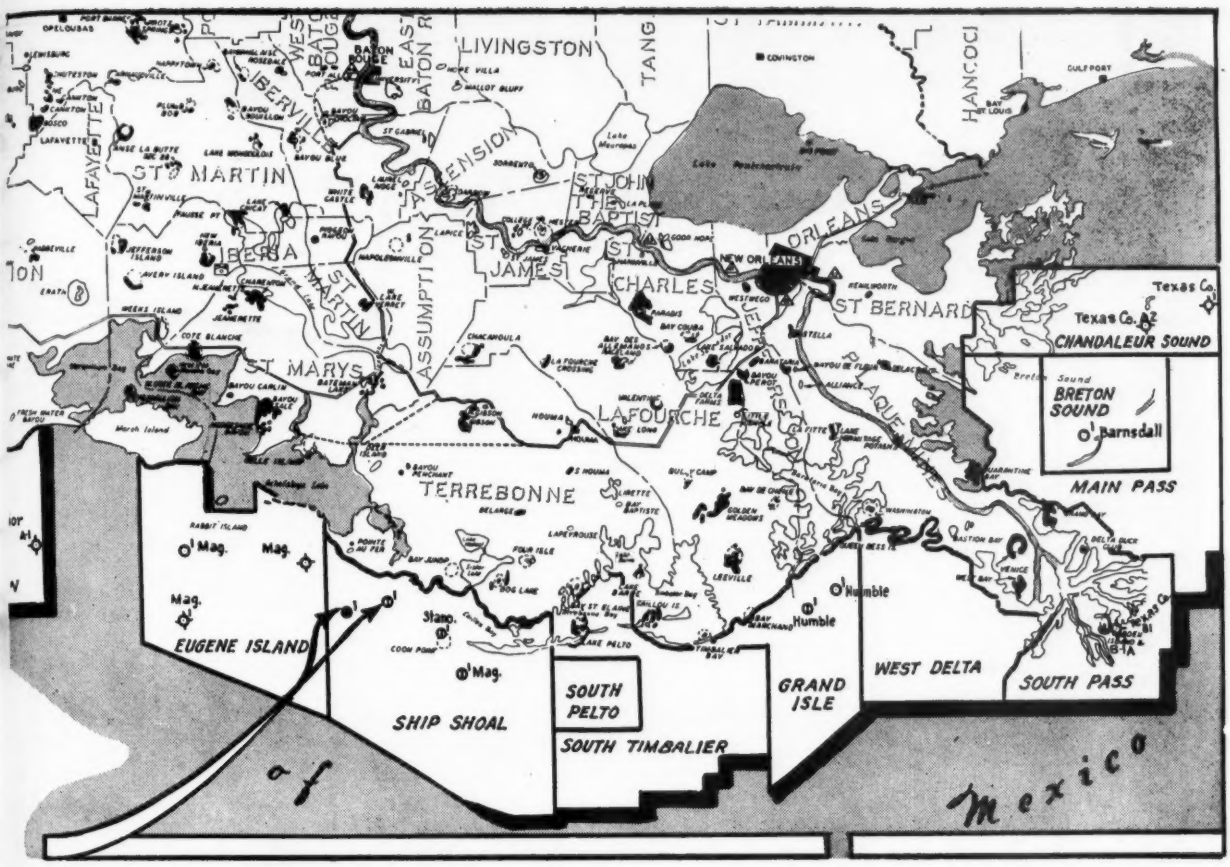
On the Block 32 structure the seismic shooting had indicated top of the salt dome at around 3,500 ft. Actual drilling found the salt somewhat higher, at 2,538 ft. The shallow pay of course overlies the salt plug, and how many pay sands might lie tilted up against the side of the deep-seated salt plug—and what reserves might be there—must await further drilling around the periphery of the discovery well.

Considerable sand comes in with the production. Casing perforations (1,734-50 ft.) were 36 ft. above the indicated water table. In making drill-stem tests with tubing, sand blocking was encountered, so the tubing was loaded with fluid and then flow slowly started up. Kermac production men state that one "picture" of the very loosely consolidated shallow sand zone is that "the sand is floating in the oil." Consideration is being given to using gravel-packed liners or similar approaches on future completions.

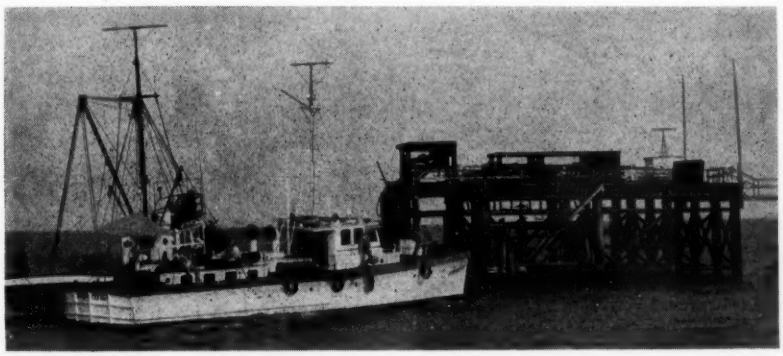
On the Block 32 discovery well 400 ft. of 20-in. conductor pipe was set, 1,730 ft. of 13⅜-in. protection pipe, and a 9⅝-in. liner. A tentative pipe program for the development wells on Block 32 calls for 130 ft. of 16-in. conductor pipe, 600 ft. of 10¾-in. protection pipe, and a 7-in. casing string set through the sand. An attempt will be made to circulate cement to the surface on these wells.

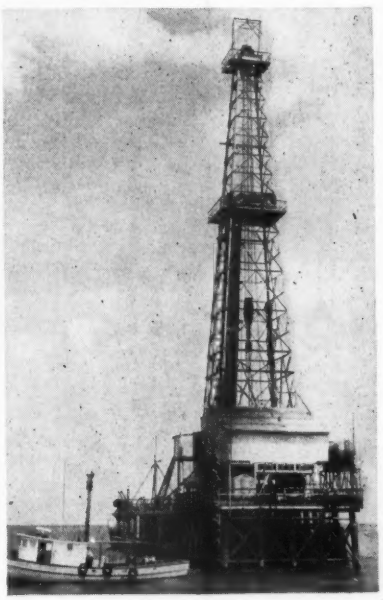
The Block 32 crude contains only 1½ per cent gasoline but has a high lube-oil content. As a matter of fact, it meets the specification for No. 5 burning oil, and purchasers have bid $3.40 per barrel on that basis f.o.b. New Orleans.

At the Louisiana State hearing for the discovery, future allowable for the new well was fixed at 400 bbl. per day because of the tremendous drilling costs and difficulties coincident with securing this type of production. Cost was approximately



KERR-McGEE ET AL 900 BBL. BLOCK 32 DISCOVERY WELL, AND . . . . . BLOCK 28 ACTIVE TEST





$450,000 for the discovery well (2,568 ft. total depth). This drilling platform itself cost about $240,000 of this total.

Development Program

With a potentially huge reserve of crude discovered, the next problem confronting the operators was the method to be followed in developing it. Tentative initial plans call for the directional drilling of up to 16 wells from the original platform. A specially designed, shallow drilling rig has been built by Franks Manufacturing Co., Tulsa, and would be in use now except for an unfortunate mishap. On February 23, while the skid-mounted draw works and prime movers were being transferred from a barge to the drilling platform, the hoisting hook broke, dropping the $55,000 worth of equipment into the 18-ft. waters of the Gulf of Mexico. Subsequently the equipment has been salvaged from the water and has been returned to Franks for repair.

Kerr-McGee officials are somewhat skeptical of the outcome of their directional drilling activities because of the extreme softness of the formations which have to be penetrated. However, first attempts will be made along this line and if unsuccessful, additional platforms will be constructed to provide for drilling of wells to drain the reservoir.

The directional drilling program calls for hole deviation to start at 250 ft. and for the holes to bottom a minimum of 660 ft. from the platform. If this is successful, 10-acre drainage will result and a total of 16 wells will have to be drilled in order to drain all three production sands. Officials are hopeful that the three

(Continued on page 113)

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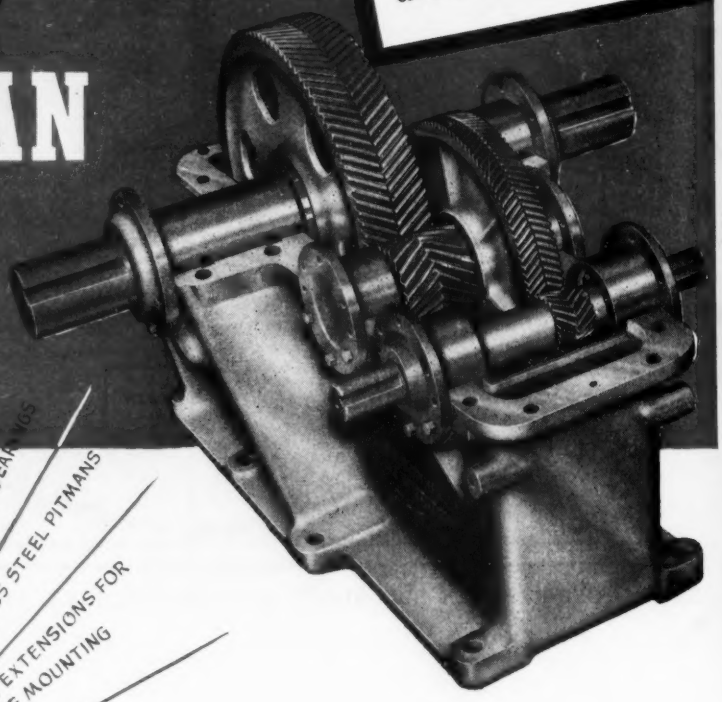

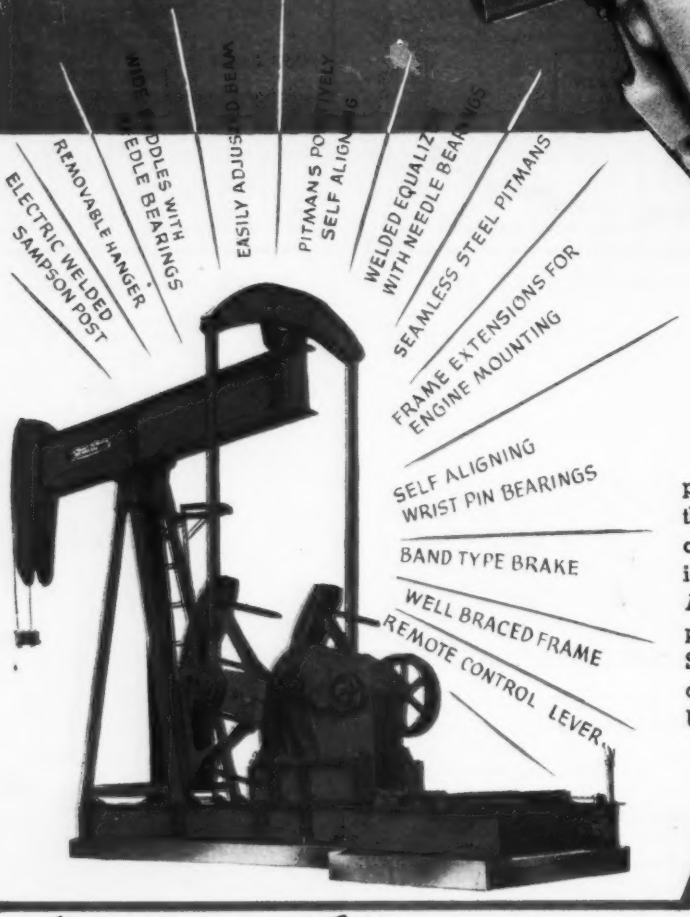

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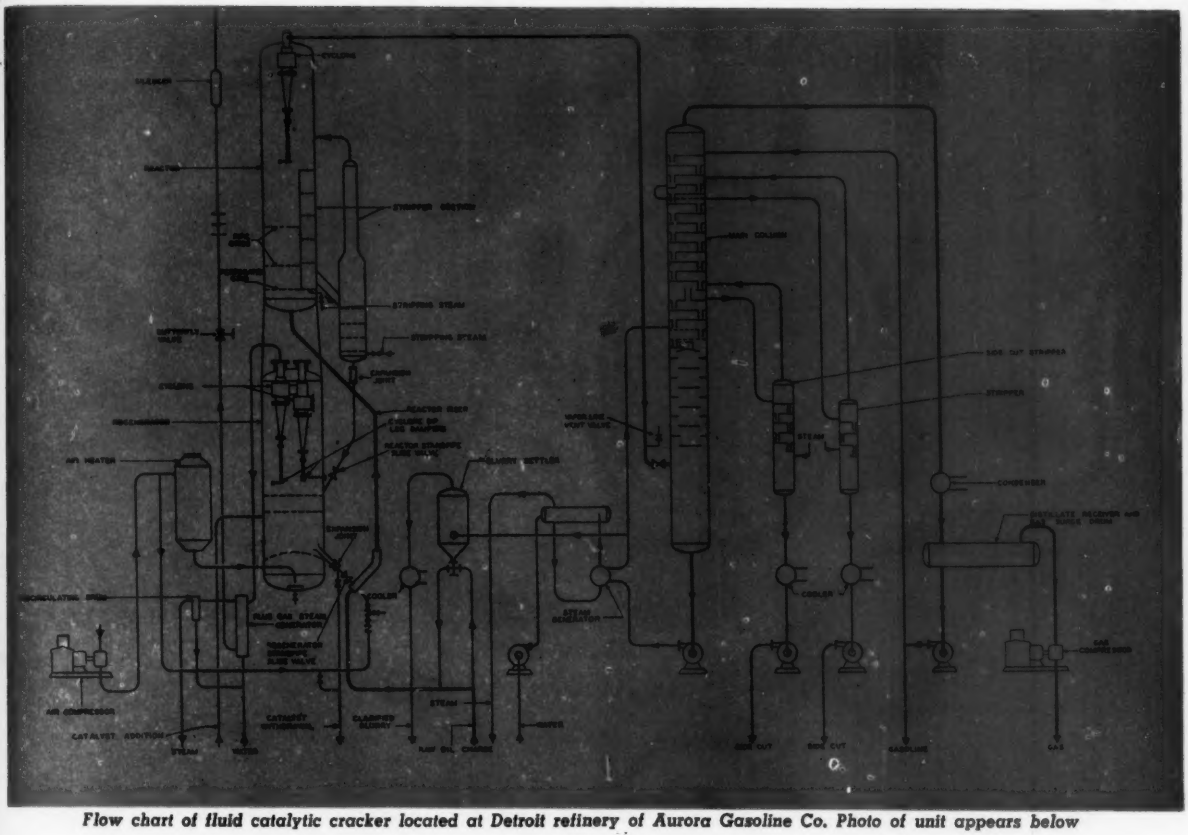


Flow chart of fluid catalytic cracker located at Detroit refinery of Aurora Gasoline Co. Photo of unit appears below

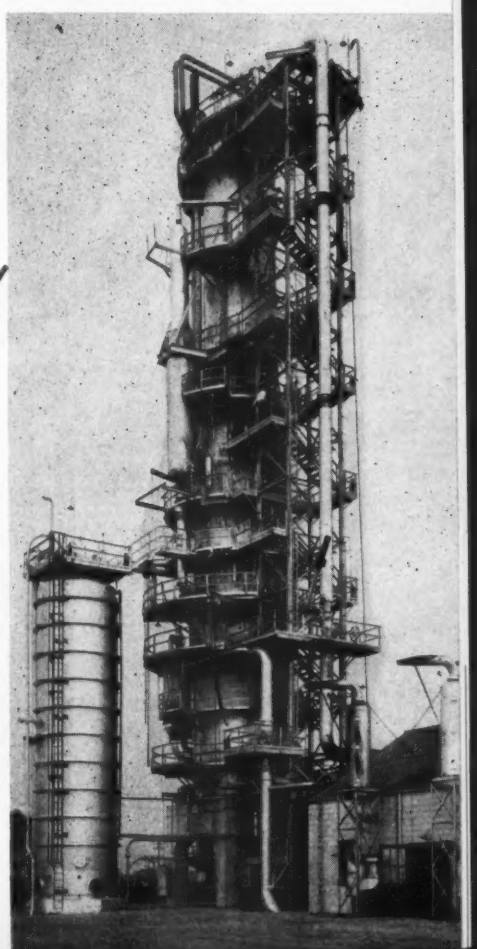
Less Than 10 Days Needed For Aurora's New Fluid Catalytic Cracker Turnaround

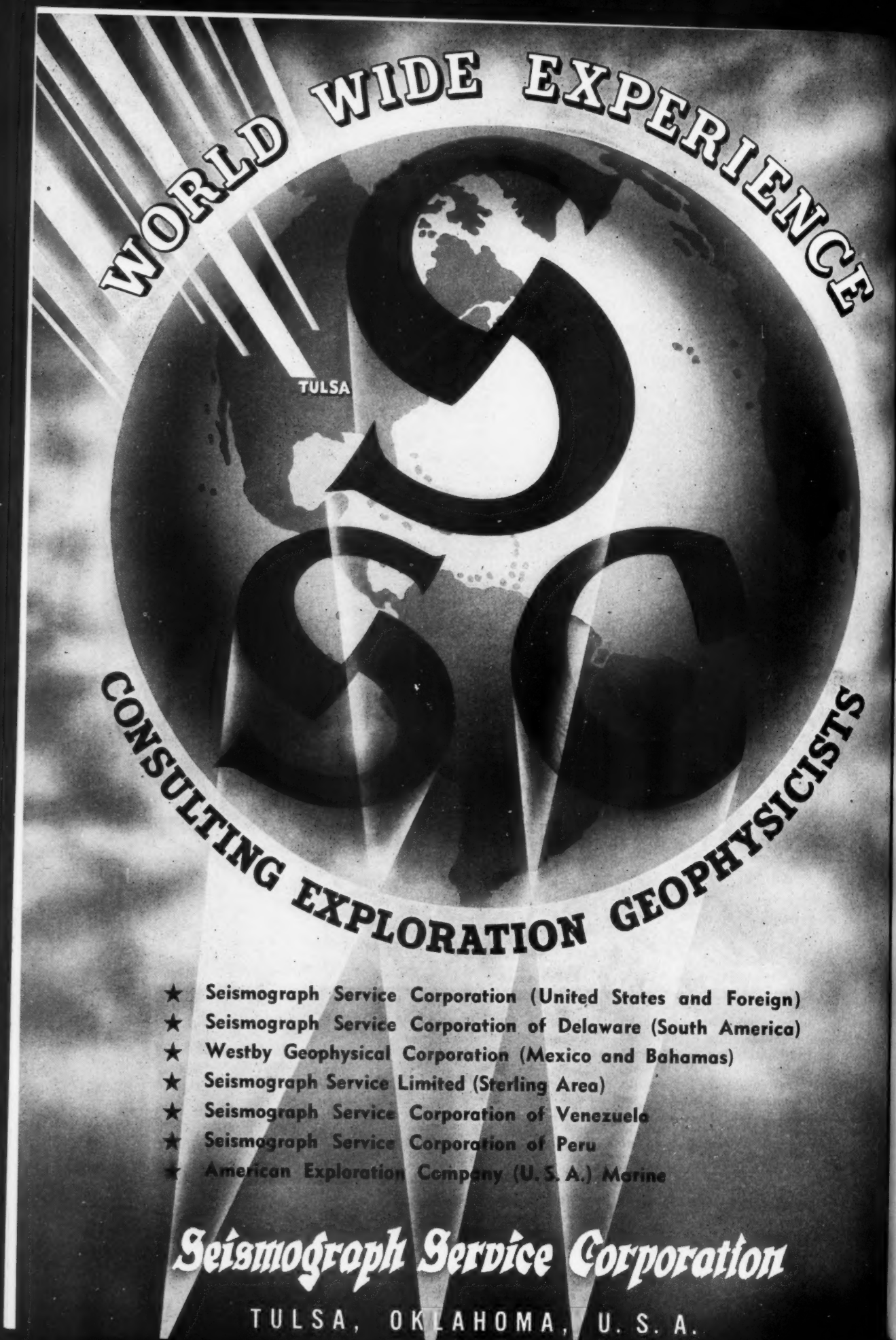
by Arch L. Foster

LESS than 10 days were required for Aurora Gasoline Co. to shut down its fluid catalytic cracking unit at Detroit, inspect it, and prepare for start up after an initial 6-month run. This turnaround period, which was scheduled to take place in early December 1947, before the onset of cold weather, required only 4,508 man-hours.

During the 176-day operating period the plant processed 677,400 bbl. of oil which were obtained principally from Illinois and Michigan crudes during the early part of the run, and from West Texas-Wyoming crude in the latter part of the operations. The catalyst makeup rate to maintain an equilibrium activity of 30 (U.O.P. weight rating) was equivalent to 0.34-lb. per barrel of charge stock. During this period the loss of fines from the stack and the handling losses amounted to only 0.20 lb. per barrel of charge and the replacement of catalyst withdrawals amounted to 0.14 lb. per barrel of charge. Average catalyst inventory in the unit during the run was approximately 70 tons.

Since the turnaround, the plant has been operating with an inventory of approximately 45 tons. This re-





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duction in inventory considerably increases the ratio of daily catalyst addition to inventory, which is conducive to improved qualities for the catalyst in the unit.

After the initial startup, oil was cut out of the unit a total of less than 80 hours for small changes, such as packing a coupling on the regenerator outlet line and changing various lines in the gas-recovery system. Thus, the onstream efficiency during the run amounted to 98.2 per cent and the over-all operating efficiency from June 10, 1947, when the unit was placed on stream in Run No. 1, to December 13, when the unit was brought on stream for Run No. 2, amounted to 93 per cent.

It must be kept in mind that this was the first run on this unit and the first reported turnaround on the new single-tower design of a fluid unit. The turnaround was carefully planned by Aurora, assisted by engineers of Universal Oil Products Co. (licensors and designers). The changes which were made in the unit during the turnaround are described in the following inspection summaries. The flow diagram shows the location of the various pieces of equipment which are discussed.

Basic design and process equipment of Aurora's fluid cat cracker was described by the Journal's refining editor when the unit was initially put on stream last year (see "Midget Catalytic Cracker Starts Operation at Detroit" by Arch L. Foster, The Oil and Gas Journal, August 9, 1947, pages 80-81).

Reactor

Each individual piece of equipment in the system was inspected virtually with a "reading glass," so to speak. Upon opening it was found that some iron sulfide was deposited on the walls of the unlined carbon-steel reactor; however, test holes drilled in the reactor showed that the amount of metal loss was negligible. Both of the 11 ft. 6 in. diameter pipe grids in the reactor were in good condition, but it was decided to install 1½-in. pipes between the 3-in. pipes in the lower grid further to improve the distribution of oil vapors and catalyst in the reactor.

Inspection of the perforated plate grid in the bottom of this vessel indicated that some erosion was starting on the flange of the center supporting I-beam. In order to prevent this a 2-ft. by 2-ft. by ⅝-in. wear plate was welded to the I-beam. The Buell cyclone was in good condition and no repairs were necessary. The new type automatic damper on the cyclone dip leg, which had functioned very satisfactorily during the run, needed no attention.

Lines and Valves

As the run progressed there was practically no evidence of erosion in either of the slide valves as indicated by the fact that the reactor standpipe slide valve operated within the range of 30-40 per cent opening and the regenerator standpipe valve operated at 40-50 per cent opening throughout the run. This was confirmed by dismantling and inspection of the valves during the turnaround. Each of the valves was worn only slightly in the throat and minor repairs were made by touching up the area with Resistoloy welding rod.

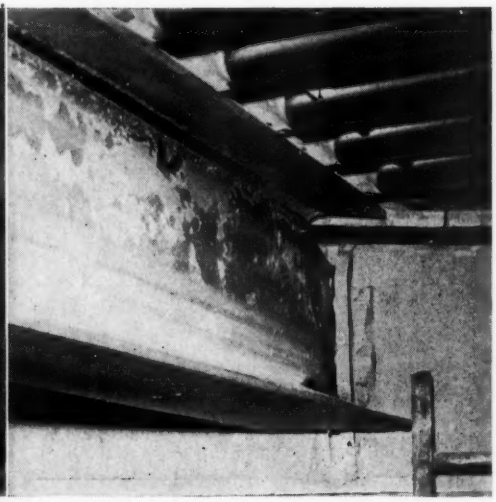
The slide in the reactor valve was worn slightly on the leading edge and since the valve was dismantled the slide was replaced. The regenerator valve slide was worn so slightly that no repairs were necessary. The operators stated that both of these standpipe valves would have continued to give satisfactory service for another year or longer.

The expansion joints in both standpipes were dismantled for inspection and it was found that the thin stainless-steel shields at the end of the liners had bent in and partially restricted the flow of catalyst. These shields were removed and aeration connected behind the liners.

Rather than take the time to repair the reactor riser, which had been eroded sufficiently to preclude the possibility of another long run, this riser was replaced with the spare riser of similar design. Since the pattern of erosion was determined in the original riser, a new design has been developed which eliminates all but one of the bends and the radius of this bend has been greatly increased. It is expected that the new design wil practically eliminate erosion in this section of the unit.

A decision was reached to insulate the 16-in. reactor vapor line valve since it was found to contain some residue and catalyst after shutdown. The 6-in. vent valve on the vapor line, which is used only in starting up or shutting down, was somewhat eroded so a new 6-in. gate valve was fitted to the vent line. The old valve, useful still for throttling on startups, was flanged to the new

Right: New type automatic damper valve in reaction cyclone dip leg



Left: I-beam supporting lower pipe grid in regenerator

Extreme left: View of spent-catalyst inlet and regenerator showing slight erosion on carbon-steel wear liner

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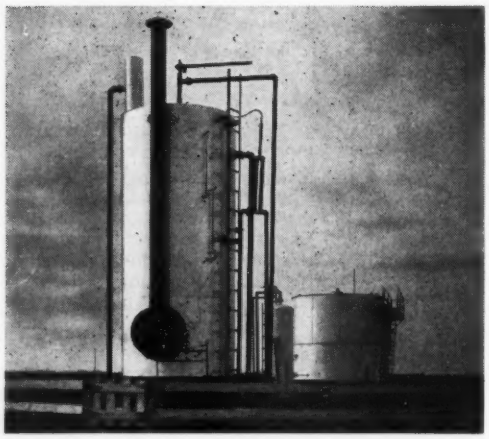

Type Y Emulsion Treater showing typical field hookup.

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valve making it unnecessary to "blind" the vent line.

The perforated grids in the silencer on the flue-gas line and the butterfly valve on the upstream side of the silencer were in excellent condition. Minor repairs were made to the butterfly valve by touching up two spots on the disk with Resisto-loy welding rod. The downstream cone on the butterfly valve had two eroded spots corresponding to those on the flapper and these were built up with welding rod in the same manner.

Regenerator

With the exception of one spot about 3 by 6 ft. in area between the two pipe grids in the regenerator just above the regenerated catalyst drawoff spout, the monolithic lining was in good condition. This 3 by 6-ft. area, which had spalled down to the supporting wire mesh, was repaired simply by troweling on a mixture of heydite, lumnite, crushed fire brick, and sand. Numerous small expansion cracks which were formed in the lining during the curing period prior to operation were still visible after shutting down but needed no repairs.

All of the grids and the Buell cyclones in the regenerator were in good condition. In order to eliminate undesired storage space in the bottom of the regenerator the bottom head was filled with sand over which a 3-in. layer of concrete was poured. The top of the concrete pad is approximately 6 in. below the bottom of the air-inlet line. This space below the bottom grid had collected some oily catalyst around the air-inlet nozzle occasionally during the run. The oil was brought in with the air from the reciprocating air compressors.

Catalyst Stripper

Although the stripper gave satisfactory performance during the run it was decided to make several inexpensive changes to determine whether an improvement in the stripping could be effected. The catalyst now flows from the reactor over two inclined perforated plates with downcomers as shown in Fig. 2. Near the bottom an inclined solid plate was provided to seal the bottom downcomer against steam rising from the horizontal steam distributing grid.

Startup Air Heater

The insulating concrete in the bottom of the outer shell of the direct-fired air heater was found to be in good condition, but the inner carbon steel cylinder lined with Sillimanite was replaced with unlined stainless steel. The top head around the tuyere firing block was insulated with B & W Kaocast. A ¼-in. stainless-steel plate was welded to the inner cylin-

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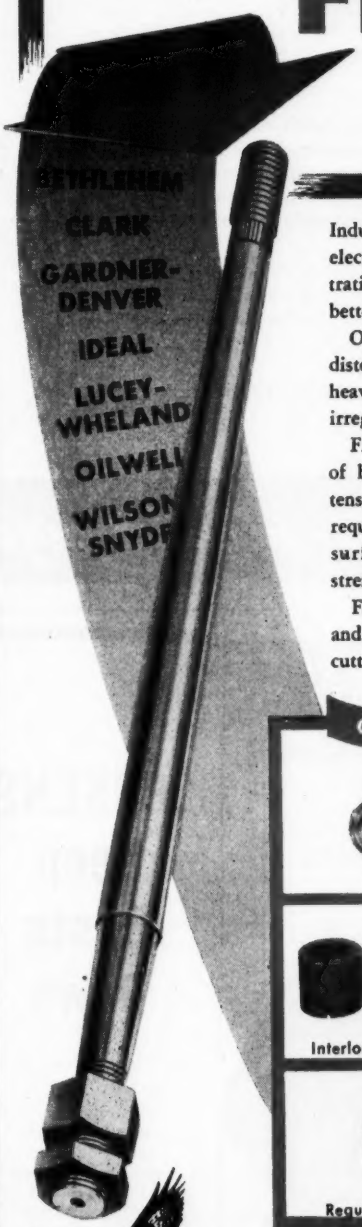

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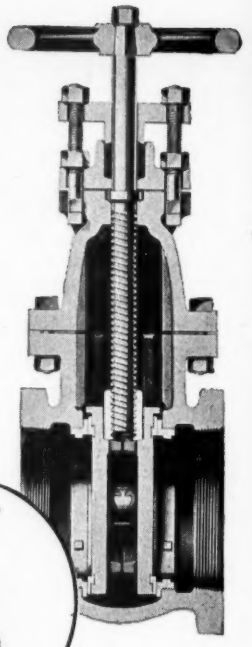

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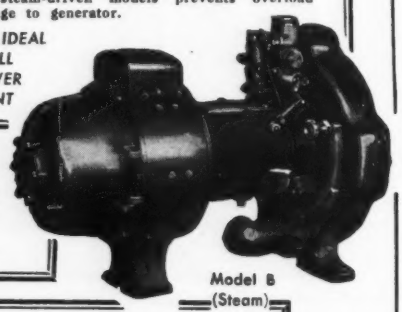

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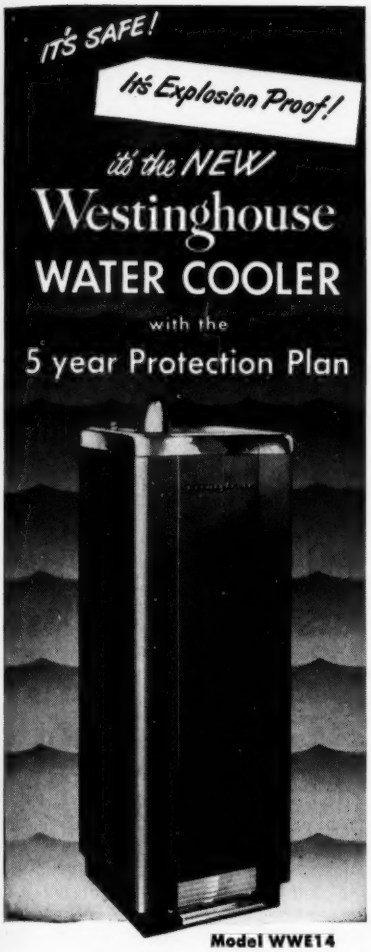

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der to cover and hold the Kaocast in place.

Waste-Heat Boiler

All fin tubes in the waste heat boiler were in good condition on the flue-gas side, but the bundle had to be retubed because of plugging from water scale. It had been known for some time during the run that the waste-heat boiler was not functioning properly after difficulty was experienced with the boiler-feed-water treating facilities.

Fractionating Column

The fractionator had been steamed and washed down twice during the shutdown and when opened it was found to be very clean. There was a small amount of catalyst in the bottom and a 2-in. layer of catalyst on the light-oil pan. Tray No. 11 which is above the light-oil pan was not functioning properly since four of the bubble caps were out of place. In order to increase the capacity of the tower the liquid level on the trays was lowered. The overflow weirs were cut to make an average weir height of 1 in. on 12 of the trays. Toward the latter part of the run this tower, which had been converted from previous thermal cracking operations, was found to be the bottleneck when the catalyst section was operated for a short time at a rate of approximately 5,000 bbl. per day raw-oil throughput.

The centrifugal slurry pump was inspected and only a negligible amount of erosion was found. In addition to the cracking section, the gas-recovery and treating facilities were given a thorough inspection, cleaning, and overhauling.

The over-all picture of this inspection or turnaround indicates that, all factors considered, the amount of replacement, repair, and substitution of material and equipment is remarkably small. The industry is gaining experience and knowledge rapidly in design, maintenance, and operation of these units, and the tremendous strides made in the reduction of maintenance costs over-all for catalytic cracking units of any type is comparable with the industry's experience with thermal cracking and other processes in the past.

Bright Stock Output Shows January Gain

Production of lubricating oils in the Midwestern area by 13 reporting companies continued to drop during January, according to Western Petroleum Refiners Association.

Of five products listed, bright stock was the only one to show a gain. Bright-stock production increased from 8,848 bbl. daily for December to 9,529 bbl. daily for January.

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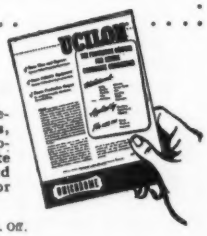

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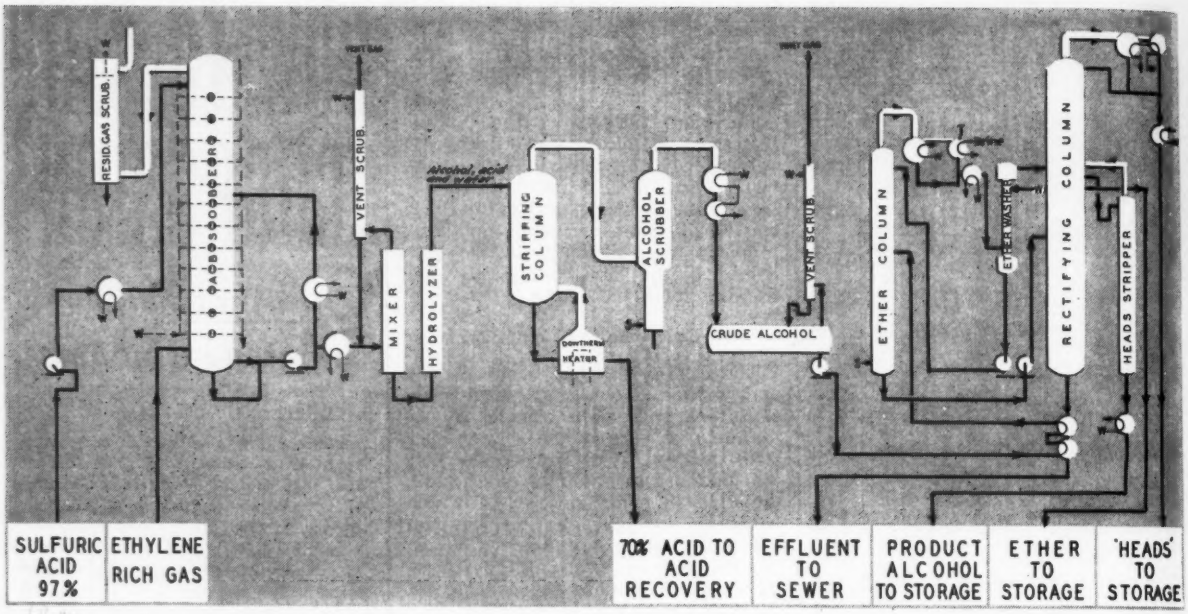


Ethanol from ethylene, absorption followed by hydrolysis. Normal yield of alcohol and ether from this process is over 90 per cent of that theoretically obtainable from the absorbed ethylene

SYNTHETIC Alcohol FROM Petroleum

by Robert S. Aries

ETHYLENE derived from petroleum cracking can be hydrated to give ethanol. Direct hydration is limited thermodynamically to rather low conversions. The reaction can be carried out indirectly by first treating the ethylene with sulfuric acid, thus forming ethyl sulfuric acid and diethyl sulfate, which, on treatment with water, hydrolyze to ethyl alcohol and sulfuric acid, which is concentrated and reused. Byproduct ethyl ether is formed from the reaction between the ethanol and the unhydrolyzed ethyl hydrogen sulfate.

Chemical engineering and design data are given on all the methods of synthetic ethanol production, stressing the procedures now in commercial use in the United States. The reaction $C_2H_4 + H_2O \rightleftharpoons C_2H_5OH$ is exothermic, $-\Delta H = +10{,}964$ cal. at 15° C. The equilibrium is favored by low temperature and high pressure. At 200° C., and with a water to ethylene ratio at 2 to 1, the equilibrium reaches 20 per cent conversion at 300 psi. Recycling is required, and a concentrated source of ethylene must be used to prevent the building up of inerts.

The commercial sulfuric acid and processes absorb the C_2H_4 in 90 per cent acid or higher. The liquid product is hydrolyzed and stripped of alcohol and ether. After scrubbing with caustic soda, the alcohol is rectified, and a very pure product is obtained. A flow sheet of the process is given and its economics are indicated.

The manufacturing costs of producing synthetic ethanol from ethylene under American conditions are less than 10 cents per gallon. This would include fixed charges, plus operating costs such as labor, maintenance, and utilities. Credits for the H_2SO_4 and ethyl ether have also been allowed in this figure. The ethylene cost, which should be added, will depend upon the specific conditions involved.

INDUSTRIAL ethyl alcohol ranks high in the list of essential raw materials for the chemical-process industries, both as a solvent and a starting point for many chemicals such as acetaldehyde, acetic acid, ethyl acetate, etc. Its methods of manufacture have thus attracted the attention of chemists and engineers for many years. Traditionally, alcohol is made by the fermentation of carbohydrates, either in the form of starches as in grain or as sugars in blackstrap molasses and sulfite waste liquors. However, the manufacture of synthetic ethanol from ethylene has become an increasingly important industrial process in recent years. In view of its favorable economics, the processes described as well as the production of byproduct ethanol from the Fischer-Tropsch-type synthesis using natural gas or eventually coal as a raw material, are slated to become increasingly important throughout the world.

Source and Purification of Ethylene

An average petroleum refinery employs mixtures of ethylene with other byproduct gases as fuel for boilers. To make ethylene in quantity calls for adjustment in the usual refinery practices. This is important in the production of alcohol, because if the proper amount of ethylene is not produced as scheduled, the alcohol plant cannot operate on a definite time table. Data on "once through" fluid catalytic cracking operations may be interpreted to indicate that some 9 per cent of the C_3—and lighter frac-

THE AUTHOR

The author's education includes three degrees in engineering with a degree also in business administration. He was educated in the Universities of Minnesota, Polytechnic Institute of Brooklyn, Yale, and Columbia. In addition, he is an adjunct professor of chemical engineering at Polytechnic Institute of Brooklyn.

Dr. Aries has always attempted to link chemical engineering and economics in his work, which is well demonstrated by the process and cost evaluation in this article. At Polytechnic Institute of Brooklyn he does development work on petroleum chemicals and teaches in the graduate school. He also heads the firm of R. S. Aries and Associates, consulting engineers and economists, and is engaged heavily in consultation work in the United States, England, and France. His interests include the manufacturing and uses of alcohol, ethylene oxide, and glycol, and the separation of oxygenated products from the Fischer-Tropsch synthesis. He has authored more than 60 articles of a technical and economic nature on the chemical process industries.

tion consists of ethylene; the yield of this fraction ranges from 6-14.5 per cent of the charge. Vapor-phase cracking can yield a gas containing 20-25 per cent ethylene, and higher percentages of ethylene can be obtained by cracking ethane-propane mixtures or the propane-butane cut of stabilizer gas. Fractions containing varying percentages of ethylene can be obtained in the course of operations designed for other products, such as butadiene and isoprene.

Provided that the ethylene content is sufficiently high, the saturated hydrocarbons, chiefly methane and ethane, need not be removed. However, most of the higher olefins must be removed to prevent excessive polymerization. In some cases it may be found desirable to crack crude petroleum, specifically for chemical by-products, thus getting a high percentage of purer ethylene which is well suited for conversion to alcohol.

Direct Hydration Process

The reaction $C_2H_4 + H_2O \rightleftarrows C_2H_5OH$ is exothermic, $-\Delta H = +10{,}964$ cal. at 150° C. The values for the free-energy change lead to the following values for log K: at 300° K, 1.119; at 400° K, —0.81; at 500° K, —2.02; at 600° K, —2.80. The formation of alcohol is favored by low temperature and high pressure, and the conversion of ethylene is favored by having a high ratio of ethylene to water, so far as it is economical to do this. At the lower temperatures the pressure cannot be increased indefinitely because the water would condense, thereby changing the equilibrium unfavorably, and at higher temperatures increase of pressure tends to cause polymerization of the ethylene. At 200° C., and with the water-to-ethylene ratio at 2 to 1, the equilibrium reaches 20 per cent conversion at 300 psi., but at 300° C., and with 5 to 1 water-to-ethylene, equilibrium conversion is only 15 per cent at 1,200 psi.

At the low temperatures necessary for favorable equilibrium the reaction rate is slow, and therefore catalysts must be used. Commercial utilization of the process has been proposed, presumably with efficient catalysts, although published data only indicate rather low conversions. At 290° C. and 1,500 psi. (conditions under which the equilibrium conversion is only 8 per cent) conversions of 2-4 per cent were obtained with a contact time of 60 seconds. British investigators have used, as catalysts, complex phosphates of many metals, including iron, nickel, calcium, strontium, barium, and magnesium. Research in the United States found aluminum oxide the most active catalyst of about 20 materials, including oxides and phosphates of aluminum, thorium, and tungsten.

Side reactions are not important at moderate temperatures and pressures. Some workers found polymerization at 350° C., but not at 320° C. or below, while other apparently did not get polymerization or ether formation at 150°-300° C. and pressures up to 1,500 psi.

Since the conversion per pass is necessarily low, recycling is required, and a comparatively concentrated source of ethylene must be used to prevent the building up of inerts.

Despite the somewhat adverse theoretical considerations such as the low conversion per pass, the direct hydration process presents some distinct advantages such as lower investment costs, no necessity for corrosion-resistant equipment, and the elimination of the acid solutions. Many of the world's leading chemical companies have investigated the process and Shell Oil Co., Inc., is building a commercial installation utilizing this process, which will use substantially pure ethylene feed in order to recycle the unreacted ethylene. The operating costs of this process are expected to be similar to the ones using sulfuric acid.

Chemistry of Sulfuric Acid Process

The hydration of ethylene to alcohol can also be carried out indirectly, by first treating the ethylene with sulfuric acid, forming ethyl sulfuric acid (ethyl hydrogen sulfate) and diethyl sulfate.

$$C_2H_4 + H_2SO_4 \rightarrow C_2H_5HSO_4$$

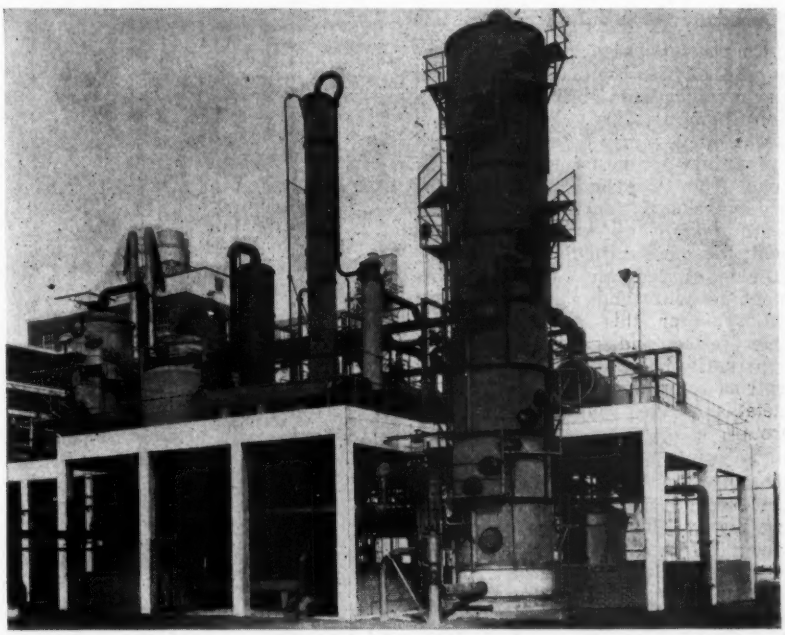
$$C_2H_5SO_4 + C_2H_4 \rightarrow (C_2H_5)_2SO_4$$

The ethyl sulfuric acid and diethyl sulfate, on treatment with water, hydrolyze to ethyol alcohol and sulfuric acid.

$$C_2H_5HSO_4 + H_2O \rightarrow C_2H_5OH + H_2SO_4$$

$$(C_2H_5)_2SO_4 + 2\,H_2O \rightarrow 2\,C_2H_5OH + H_2SO_4$$

This process, which amounts to an



Typical equipment for petroleum chemicals. (Courtesy Vulcan Copper & Supply Co.)

indirect hydration of ethylene, is not limited to the equilibrium of the direct hydration, because the equilibrium is disturbed by diluting the concentrated acid solution. The free energy change of dilution of the acid is therefore added to that of the direct hydration, so that almost quantitative yields are thermodynamically possible. This process has, however, the undesirable feature that relatively large amounts of dilute sulfuric acid must be reconcentrated, unless there is some other outlet for the dilute acid in the same plant.

In order to avoid the reconcentration of sulfuric acid, efforts have been made to develop a process which uses acid throughout. The formation of ethyl sulfates, and their hydrolysis, are carried out in the same equipment, and the sulfuric acid is, in effect, acting as a catalyst. High pressures and relatively high temperatures are required. Thus ethylene and steam may be bubbled at 600-1,000 psi., and 250° C. through sulfuric acid in a vessel packed with Raschig rings. The countercurrent principle may be utilized, in which a large quantity of sulfuric acid is circulated, so as to keep the alcohol concentration low, thereby reducing ether formation. However, the high operating pressure necessitates special equipment, and very severe corrosion problems are encountered in handling 8 per cent sulfuric acid at 250° C. This process is not operated commercially yet, although the relatively high conversions of 90 per cent is claimed. The fact that impure gases can be processed and the elimination of the acid concentration step may in certain instances outweigh the disadvantages of the processes.

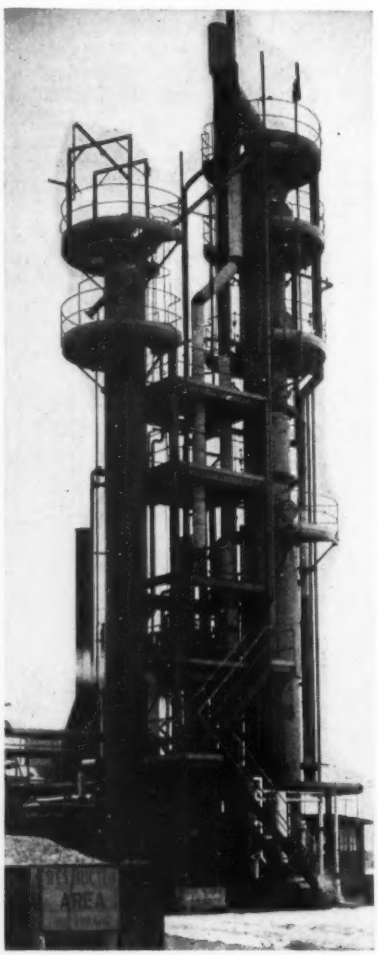
Concentrated Sulfuric Acid Process

Concentrated acids are used by Enjay Co. of Esso Standard Oil Co. and the several plants of Carbide & Carbon Chemicals Corp.

This process may be compared with the similar synthesis of isopropyl alcohol from propylene, another refinery byproduct. Propylene is, however, more readily absorbed in sulfuric acid; the more difficult absorption of ethylene necessitates special equipment to withstand corrosion. Many catalysts for this absorption have been tested and silver sulfate has apparently been found effective, as well as compounds of copper and of metals of the iron and platinum groups.

The ethylene-containing gases make contact with sulfuric acid, 90 per cent strength or higher, in an absorbing tower. The tail gases from the tower, after scrubbing with caustic soda, can be used as fuel. The liquid product from the absorbing tower, containing ethyl hydrogen sulfate and diethyl sulfate, passes to a hydrolysis chamber, and then to a column in which it is further hydrolyzed and stripped of alcohol and ether vapor. The mixed vapors of alcohol, ether, and water, after being scrubbed with caustic soda, are condensed and sent to a crude alcohol storage tank. In the alcohol purification section an ether column takes off the ether, which is washed and sold as a byproduct; the alcohol is then rectified in one column. A very pure product is made.

The sulfuric acid leaves the system as a black, dilute acid from the alcohol stripper. Reconcentration of the dilute acid, in one American plant, takes place first in an acid reboiler, which brings the concentration up to 70 per cent; the evaporated steam is returned to the stripper. For further concentration this plant uses a Simonson-Mantius two-stage vacuum system which concentrates sulfuric acid without causing objectionable fumes. In the first concentrator the acid is brought up to 89 per cent under 2.5 psi.; in the second it is brought to the final desired concentration at 0.4 psi. Because of the low pressures the acid temperatures are kept below 370° F., but since, even at this temperature, steam as a heating medium would require very considerable pressures, Dowtherm A vapor is used, which gives a temperature of 575° F. (thus providing ample temperature drop) at a pressure of only 20 psi.



Ethylene cracking unit for alcohol. (Courtesy Foster Wheeler Corp.)

The advantages of the process are the relatively high conversion to alcohol (70-80 per cent) and the fact that gases containing as low as 30 per cent ethylene can be successfully processed. On the other hand, it has some disadvantages, such as the concentration of considerable amounts of acid and the necessity of using special equipment. The equipment consists of steel pressure vessels with linings and internal parts of lead, ceramic materials, Karbate, glass, Hastelloy, Duriron, etc.

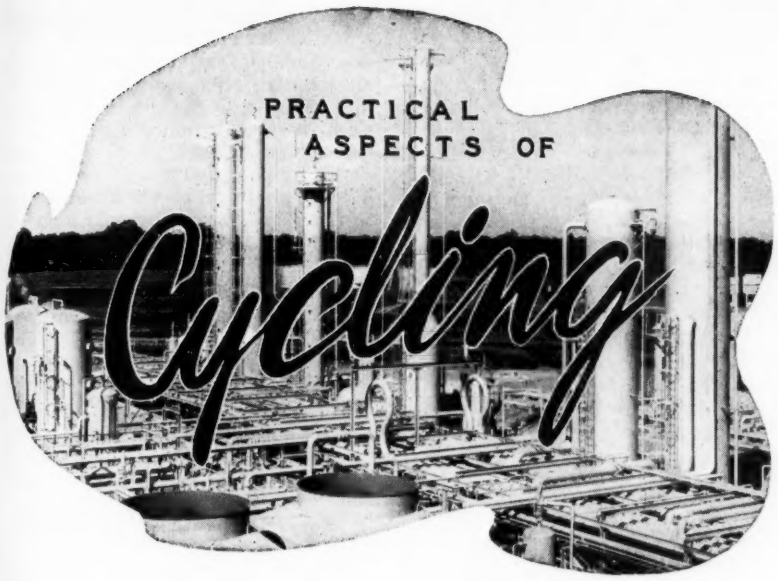
Flow Sheet of Process

The following is a detailed description of a typical process for large-scale production of ethyl alcohol from ethylene. The process as shown, with certain variations in some cases, is representative of this process as practiced in the United States today. The normal yield of alcohol and ether from this process is over 90 per cent of that theoretically obtainable from the absorbed ethylene. Ether production amounts to over 5 per cent of the alcohol. Normally, the alcohol produced is of a denaturing grade; but, by modification of the distillation equipment, a higher grade of spirit may be produced.

Ethylene-rich gas, containing 32 to 100 per cent ethylene, enters the bottom of the absorber and passes upward in a countercurrent way to a descending stream of sulfuric acid and ethyl sulfates. The pressure in the absorber is 200 to 500 psi., depending upon the concentration of ethylene in the feed stock. The absorber is operated at a temperature of approximately 180° F. Because the absorption gives off heat, it is necessary to provide for internal cooling coils to maintain this temperature. Liquid from the base of the column is also cooled and recirculated to an intermediate point in the column in order to maintain the desired temperature and ethyl sulfate concentration. Fresh sulfuric acid of approximately 97.5 per cent strength (about 2 lb. for each pound of alcohol produced) is introduced into the top of the column. Residual gases from the top of the column are washed with water to remove entrained acid and pass out to other uses.

The liquor flowing from the base of the absorber is a mixture of diethyl sulfate, ethyl hydrogen sulfate, and sulfuric acid. This liquid is cooled and passes to a mixing vessel in which an intimate mixture of this solution with water is obtained. The mixture then passes to the hydrolyzer in which hydrolysis is completed. The liquid

(Continued on page 133)



by Martin G. Miller and Max R. Lents

Economics is the phase of gas cycling discussed in this article, which follows the authors' complementary article published in last week's Journal. Both men are associated with the cycling project in Old Ocean field.

IN the cycling business, engineering considerations must be viewed in the light of prevailing economics. This may best be accomplished by attempting to estimate the present worth of the particular reservoir under various types of operation. Present worth should indicate the desirable type of operation in most cases with the exception of those where unusual tax situations must be considered.

The Economics

The economics involved are as follows:

1. The problem of plant processing as opposed to stock-tank operations is probably the simplest study to make and is not concerned with the decision to cycle or to deplete. The retrograde loss principally affects the pentanes and heavier components of the gas and is almost equally acute (barrel-wise) in either case. The economics of plant processing may be determined by a comparison such as that shown in Fig. 1 of our previous article.

2. Gas-condensate properties offer two types of income:

(a) Income from the sale of residue gas as such.

(b) Income from the liquids derived from the reservoir gas by normal production and mechanical separation or by some type of plant processing.

3. Cycling results in a deferment of the income that might be derived from the current sale of residue gas. Referring to Fig. 1 in previous article, in either case of which the value of residue gas was based at 5 cents per thousand cubic feet, it should be readily apparent that if residue gas prices double or triple without a corresponding adjustment of liquid prices, deferment of this portion of the potential value of each unit of reservoir gas would require substantial consideration.

4. Production by depletion basis dictates that the producing rate and the rate of liquid recovery as well as sale of gas be limited to the size of available gas markets. Further, the producing ability of each well is a function of reservoir pressure and declining pressure means declining well capacity.

5. Production of reservoir gas and consequently the rate of liquid recovery by cycling operations in most gas-condensate reservoirs is limited solely by the size of the processing plant and injection facilities.

It follows that, strictly speaking, the economic advantage of cycling over depletion is equivalent to an algebraic summation of the following:

Present value of difference in liquid recovery less the loss in present value of the gas sales due to their deferment less the cost of injecting gas.

In the past, because of limited market outlet and low residue-gas prices, such comparisons have been generally superfluous; however, the time is approaching when all types of operation are possible and must be considered. Substantial gas markets are available to many fields today and as a result depletion operation should and are receiving more consideration than in the past.

If it is realized that for many cycling prospects, 70 per cent recovery by cycling is considered a good figure and that many condensate-bearing gases have less than 30 per cent retrograde loss, it is readily apparent that many cycling projects in the past have been simply a means of providing present-day dollars for otherwise nonincome-producing properties.

In regard to the cost of cycling plants, it should be understood the compressor plant for returning gas to the formation represents a substantial part of both investment and operating expense. A modern cycling plant of about 100 M.M.c.f. capacity might today cost about 4½ million dollars of which 25 per cent is chargeable to the injection facilities. This does not include cost of injection wells, injection lines, and any additional production wells required for the cycling operation.

Examination of a Cycling Prospect

Here are summarized the major items that should be investigated or determined before a cycling project is started:

1. **Determination of the "wet gas" in place.**—This involves knowledge of the extent of the field, thickness of sand, porosity of sand, connate water within the sand, reservoir pressure, reservoir temperature, and deviation factor of this particular gas from the gas laws.

2. **Properties and characteristics of gas** are determined by carefully collecting samples of the produced gas and separator liquid under pressure and then recombining these samples in the proper percentages in a laboratory equilibrium cell where the influence of pressure and temperature upon this gas may be studied. From this work the magnitude of retrograde condensation loss may be reasonably predicted and the liquid content of the reservoir gas determined under various production methods.

3. **Determination of the flood pattern** of the injected gas, if the gas reserves are of sufficient magnitude to warrant further investigation and the retrograde loss is appreciable. Iso-vol or pore space maps should be constructed which reflect the reservoir in as much detail as is known. These maps should indicate only those portions of connected sand. The influence of minor shale breaks, permeability barriers, etc., must be thoroughly investigated.

From this iso-vol map a scale model is constructed and, using the wells available, model studies are made to determine the flood pattern that may be induced. These model studies employ the analogy which exists between the flow of electricity through an electrolyte and the flow of fluids through porous media. Very often

these model studies will indicate that additional wells will be required for either production or injection service if a reasonable flood pattern is to be obtained. These additional wells are chargeable to the cycling cost. Prior to the model studies, production tests on completed wells must be made to determine the permissive limits of gas production and injection so that rates used in the model can be obtained in actual performance.

4. **Consideration of producing rate:** After having completed the model studies, investigated sand conditions, and having determined the retrograde loss, an estimate can be made of the increase (or decrease) in recovery of condensable hydrocarbons which will occur due to return of gas and maintenance of reservoir pressure. If the prospect is a borderline case, the decision to cycle may be greatly influenced by the rate of return (or income on liquid products) from the properties by permissible cycling rates as compared to those production rates available during straight depletion and sale of gas.

5. **Processing vs. stock-tank operation.** Production tests in the field will have already indicated the quantity of liquids per million cubic feet of gas which will be produced through separators to stock tanks. These quantities can be compared to those recoverable by a plant of given design. For this purpose, a plant recovery efficiency may be assumed and these recovery figures applied to the gas composition.

For example, in a modern plant today the following recovery figures might be used:

40 per cent of the propane
80 per cent of the butanes
99 per cent of the pentanes and heavier

These quick comparisons of separator recovery to plant recovery indicate the magnitude of increased recovery due to plant processing and will generally provide sufficient information from which the decision may be made to process the gas, if sufficient gas reserves are available. After this decision, the size and type of plant must be investigated further.

6. **The size of the plant** is usually determined by the size of the reserves, if the reservoir is to be cycled. The plant must be large enough for its current income to be not greatly affected by operating overhead. It cannot be larger than the available production rates. The actual size is finally a business decision.

It might be interesting to mention several of the existing cycling plants and the relative size of the reserves connected to the plants:

(a) The Cotton Valley field (Louisiana) has 150-million-cubic-foot capacity for a 400-trillion-cubic-foot reserve.

(b) Benton field (Louisiana) has a 100-million-cubic-foot plant for a 200-trillion-cubic-foot reserve.

(c) Katy field (Texas) has a 450 to 500-million-cubic-foot plant for a gas reserve of several trillion cubic feet.

In the event the plant is to process only sales gas, its size will, of course, be determined by the sales outlet available. Where the sales outlet varies, as with seasonal demand, the plant must be designed to pass the maximum quantity expected even though efficiency may or may not be sacrificed at high gas throughputs.

7. **The type of plant.** Fig. 1 illustrates the value of the recovery from 1 million cubic feet of gas by typical types of processing compared to stock tank operations.

Range of Plant Design

Actual plant design may range as follows:

(a) The simplest type of plant would recover: (1) L.P.G. products—liquefied petroleum gas composed of a mixture of propane and butane and would consist principally of butanes. This material would be sold by tank car or tank truck for domestic fuel. (2) Stabilized distillate—would consist principally of pentanes and heavier and would normally be sold by pipe line.

(b) An intermediate type of plant might recover: (1) L.P.G. as a mixture or separately as propane for sale to chemical plants, isobutane for L.P.G. or refinery use and normal butane for L.P.G., for blending in natural gasoline or for refinery use. (2) Natural gasoline. (3) Stabilized distillate.

(c) The most advanced plant would separate and fractionate the recoverable hydrocarbons into component parts from propane through butanes and the heavier components into motor gasoline, kerosine, diesel fuel, etc. The propane and isobutane would be sold separately for use in refineries or chemical plants or blended to L.P.G. Some of the normal butane would be blended with motor-fuel fractions to control vapor-pressure characteristics of motor gasoline. Heavier material would be fractionated to naphthas, kerosine, diesel fuel, and heavy fuel oil.

8. **The type of products** to be manufactured is determined by:

(a) Chemical composition of the gas. For example, the composition of the heavier components of some distillates yield premium grade gasoline or naphthas.

(b) The relative prices of the various products, the expected term of the relative price conditions, and the size of the reserve. The economics of each step to manufacture an additional product must justify the added cost of plant investment which results from the individual separation of the particular components or product of the liquid extracted from the gas and their further blending into merchantable products.

9. **Plant efficiency.** After the determination of the capacity and type of plant, considerable work must be done to establish how efficiently it should be built. Five or six years ago the most efficient cycling plants were built to recover about 80 per cent of the available butanes. Any incidental propane recovered was injected or burned except for a small portion used during winter months.

When it is realized that a gallon of propane valued at about 4¼ cents per gallon is equivalent to only 36 cu. ft. of gas, worth less than ¼ cent when in the gaseous state, and when it is considered that many gas-distillate reservoirs contain as many "barrels of propane" as they do "barrels of distillate," it is obvious that considerable money can be spent in trying to recover it.

High Recovery Difficult

High recovery of propane is difficult and expensive; however, many operators are now considering the expenditure of money for this purpose. The expense involved is indicated by the recent decision of one large cycling operation to spend about $7,000,000 to raise propane recoveries from about 40 per cent to about 75 per cent.

Where the plant must process fluctuating gas quantities for sale, the es-

(Continued on page 119)

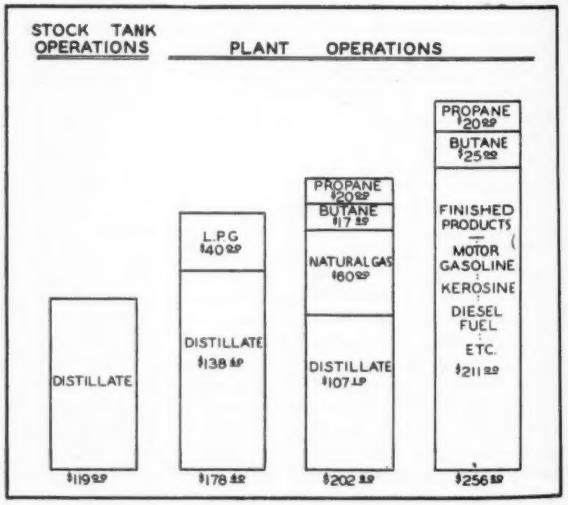


Fig. 1—Comparison of income from liquid recovery per million cubic feet of gas

Spectacular Discovery

(Continued from page 99)

sands will prove to be interconnected, thus cutting down on the number of wells that will have to be drilled.

Another problem in addition to directional drilling that will arise is that of getting the oil ashore. A number of possibilities, such as using tankers for floating tank batteries and sinking barges for storage, have been considered. However, present plans call for a 25-mile, $500,000 marine pipe line to run from Block 32 to Deer Island. Pipe has already been purchased for this line and work will proceed as soon as drilling has substantiated the reserve estimates. Pipe used will be 6⅝-in., 25-lb., with a ½-in. coating.

The proposed pipe line has brought to light another of the many problems peculiar to marine drilling. The area involved is an important shrimping and oyster center, and it will be necessary for Kerr-McGee to bury the pipe line 6 ft. beneath the ocean bottom in order that fishermen's nets and anchors will not catch on it. The question of getting the oil ashore has become involved in U. S. Army, Coast Guard, American Bureau of Shipping, and Louisiana State regulations, posing many intricate and difficult problems.

Second Test Now Drilling

Simultaneously with construction of platform for the Block 32 discovery well a second platform was being built 8 miles to the east on a seismographic high located on the operator's second 20,000-acre lease block. This well, located on Block 28, was spudded September 7, 1947, with small rotary. As soon as the Block 32 well was completed, the heavy drilling equipment and converted Navy barge were moved over to this platform and the well is currently drilling below 7,645 ft. in an attempt to find a second oil reservoir. This test is on a deep-seated salt dome and pay may not be found until around 12,000-13,000 ft. Estimated total drilling cost is $800,000. An oil and gas showing was encountered in sand at 7,595-7,607 ft., side-wall core showing gas in the top and oil saturation in the basal portion.

On the Block 28 well now drilling, Kermac has put down a 265-ft. water well which is being jetted with air to provide a fresh-water supply on location. Some difficulty is being encountered from sanding up of the well. Block 28 lies in only 12 ft. of water, as compared to 18 for Block 32.

The revolutionary marine-drilling equipment that has been used for these two wells is worthy of considerable discussion. This operation is the first in which a combination platform and floating barge has been used to drill a well in open, unprotected waters. Common practice in past years for wells drilled in the bays, swamps, and bayous of Texas and Louisiana has been to use drilling barges which were sunk in shallow water while drilling was under way and then floated to a new location. For drilling in the open waters of the gulf, all previous drilling, which has been extremely limited, was done from large platforms built on wooden or steel piling sunk in the ocean bed. These platforms were extremely large and costly as all equipment and supplies necessary for drilling a well were located on the platform.

Kerr-McGee engineers conceived the idea of constructing a platform to contain only the derrick, engine and draw works, and an emergency mud tank and pump, with the remainder of the equipment and supplies contained in a floating barge. The Block 32 platform is 38 by 71 ft. and contains a conventional National 100 rig, a 122-ft. A.P.I. derrick with substructures and 7 ft. added to the top, draw works, drilling engines, small water and fuel tanks, and a mud tank and mud pump for emergency use. These standby mud facilities were placed on the platform to provide circulation in the event that a storm or other emergency forced the drilling

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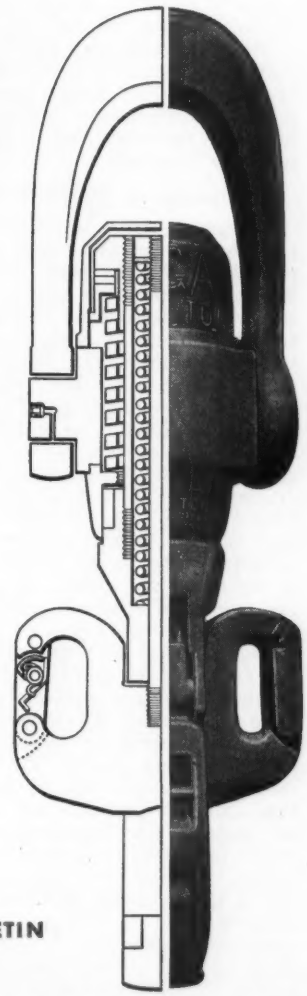

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Length of Regan Casing Hook	200-ton	300-ton
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Length Working to Hook Saddle	69"	83"
Length Working to Elevator Yoke	56¾"	60"
Spring travel, Main Hook	2½"	2½"
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barge to leave the drilling site. The derrick is designed to withstand a 125-m.p.h. wind velocity without the use of guy wires. Guy wires were eliminated because of possible interference with boat operations in the vicinity of the platform.

The platform proper is 20 ft. above mean low tide and the rig floor is an additional 13 ft. above the platform. In constructing the platform 24-in. o.d. pipe piles were sunk a maximum of 104 ft. into the ocean bed. The pilings are braced with 9⅝-in. steel pipe above the water level. Three dolphins each consisting of a cluster of 19 timber piles with a minimum penetration of 75 ft. are installed on one side of the platform to serve as a buffer between the barge and the platform. Platform for the Block 28 well is similar, except of larger size, being 44 by 78 ft. It has a 15-ft. substruction and 136-ft. derrick with 30-ft. base.

In the event of a dry hole, part of the platform can be salvaged by cutting the 24-in. piles off 6 to 10 ft. under the ocean floor. The structure can then be raised on I-beams and placed on submerged barges, raised to permit movement, and then towed to a new location.

Equipment for Marine Drilling

The second major unit of this two-unit drilling operation is a war-surplus, 260-ft. long by 48-ft. wide, Navy YF steel barge. This unit was purchaser for $75,000 from the Maritime Commission and converted by Equitable Shipbuilding Co., Madisonville, La., at a cost of $155,000, not including drilling equipment. The barge contains all the supplies and auxiliary equipment necessary for the drilling of a 12,000-ft. well in addition to drilling-crew quarters, a galley, hospital, lounge and recreation room, and radio-telephone communication facilities. In the lower or hull section of the barge are reserve and operating mud pits, 3,500-bbl. drilling-water storage, 20,000-gal. diesel-fuel storage, 20,000-gal. drinking-water storage, three electric-generating plants, pumps, and auxiliary engines.

On the second or middle deck of the three-deck barge is located the galley, sleeping quarters for 30 men, food-storage area, electric-refrigeration units, dry storage for 12 box-car loads of mud chemicals and cement, the two diesel-powered mud pumps, a work and machine shop, and a skid-mounted Halliburton cementing unit. On the top deck are pipe racks with a capacity sufficiently large to store all the drill pipe and casing necessary for the drilling of a 13,000-ft. well. In addition, the top deck is equipped with derrick cranes, one at each end of the barge, for loading purposes: a Schlumberger electric-logging and side-wall coring device; a 50,000-cu.-ft-per-minute exhaust fan for clearing the air below decks; and the customary marine facilities such as life boats, flood and navigation lights, life perservers, etc.

Fleet and Radio Communication

In the process of developing its marine-drilling operation, Kermac has built up a fleet of 16 assorted craft. These include three 85-ft. air-sea rescue boats, seven 63-ft. air-sea rescue boats, two 120-ft. LCTs (landing craft, tank), one 85-ft. 750-hp. tugboat, and three 260-ft. Coast Guard YF barges, some of which are not yet in service. One of the three YF barges is now being used for drilling the Block 28 well, the second is in the shipyards being converted, and the third was only recently procured. This entire fleet is under the supervision of Jack Phinney, marine transportation superintendent.

V. L. Janeway, communications superintendent for Kerr-McGee, has set up a complete radio network joining the boats with both the shore office and the drilling locations. Short-range ultrahigh-frequency F.M. radio telephones have been installed at all stations. Marine radio phones (ship to shore) have been installed on the YF barge, Frank S. Phillips, and the 85-ft. cruiser, Robert S. Kerr. It is planned soon to extend the network to include automobiles on land. The east and versatility of communication can be demonstrated by the fact that Tom Seale, chief engineer, was able to call Kermac headquarters in Oklahoma City from the drilling platform at the time oil was first struck in the discovery well. Some of the fleet has radio-compass equipment already installed. Janeway has submitted an application to set up a transmitter on the drilling platform so that the boats may "home" on the platform in the event of fog or darkness.

Land operating headquarters for the development program have been set up at Berwick, La., across the Atchafalaya River from Morgan City, La. This office is in charge of William Glenn, who coordinates all activities. Boats operate from this point to carry out incidental supplies, food, and to take the drilling crews to and from the rig.

One interesting point in connection with Kerr-McGee's offshore activity is the "know how" and special equipment for over-water drilling the concern is acquiring — factors which should prove important in future contracting work in this highly specialized field. For more information on this drilling-contracting firm, see "Running High," page 148.

A six-man drilling crew is used on each tour with five men on the platform and one on the barge to supervise pumps and other equipment. Crews work two 12-hour tours with 7 days on and 7 days off. In addition to the 12 men required for actual drilling operations, there are usually around 15 other men living on the barge at one time, including 4 seamen, 4 cooks, 2 tool pushers, a full-time geologist, mud engineer, and the drilling superintendent. In addition, Halliburton and Schlumberger crews are quartered on the barge during such times as the use of their equipment is necessary.

Good Conditions at Sea

The personnel angle of the operation was viewed by company officials with some trepidation in the early stages because of the distance from land and the unusual working conditions. However, turnover rate has been negligible and the "sea life" has its enjoyable aspects, with sea-trout fishing, etc. Plenty of good food has no doubt influenced this high morale. On the day that the Journal representatives visited the rig, the noon-meal menu consisted of roast beef, ham, hominy grits, creamed potatoes, egg salad, potato salad, spinach, asparagus, corn, gravy, milk, iced tea, and lemon pie. Cooks are kept busy full time as all crew members eat four meals a day in addition to snacks when going on and off tour. Jim Sheeley is hired full time to act as steward in the procurement and supervision of the preparation of the food for the rig.

The LCT Dean Terrill has a crew consisting of a captain and engineer, and two seamen who are employed on a monthly salary with shore leave at such time as operations permit. The smaller 63 and 86-ft. boats have a captain and an engineer aboard. One of the smaller boats is kept standing by the rig at all times for use in the event of an emergency.

Tom Seale, chief engineer for the company, is in over-all charge of marine operations. W. F. Baxter is Gulf Coast drilling superintendent. George Parks is marine production superintendent for Kermac. George Cobb, general production superintendent, and Otis Danielson, drilling engineer, both headquartering in Oklahoma City, have aided in the planning and the design of equipment. Sid Walker has been assigned by Phillips Petroleum Co. as project observer.

Seismograph work for the operation was done by American Exploration Co. of Lafayette, La., which operates exclusively in over-water exploration. It is affiliated with the Seismograph Service Corp. of Tulsa. Operating fleet of Amexco consists of 30 boats, most of which are 83-ft. converted air-sea rescue boats.

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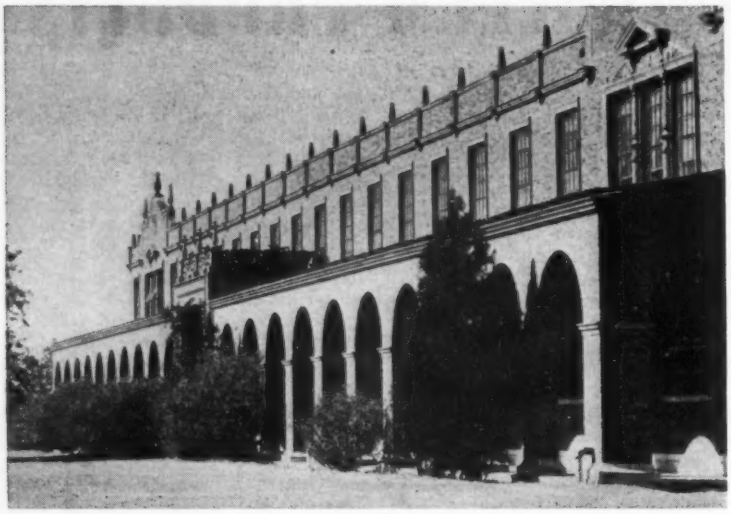

Main engineering building, Texas Technological College

SALIENT FACTS AND FIGURES

General.—Opened in 1925, Texas Technological College has experienced rapid growth. Current enrollment exceeds 6,000. Coeducational, state controlled and supported, the college is administered by a board of nine directors appointed by the governor. Dr. W. M. Whyburn is president. Graduate and undergraduate work is offered in the divisions of engineering, arts and sciences, agriculture, business administration, and home economics. Textile-engineering department is the only one of its kind west of the Mississippi River.

Buildings and grounds.—The campus includes more than 2,000 acres with 22 major permanent buildings, supplemented by a number of temporary frame structures erected to meet recent enrollment increases.

Tuition.—Residents of Texas pay $25 per semester tuition, nonresident fee is $150. Room and board in college dormitories is $47.50 per month.

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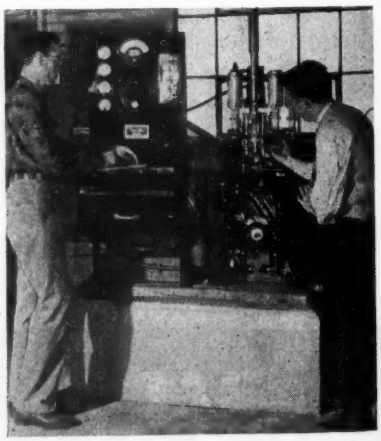
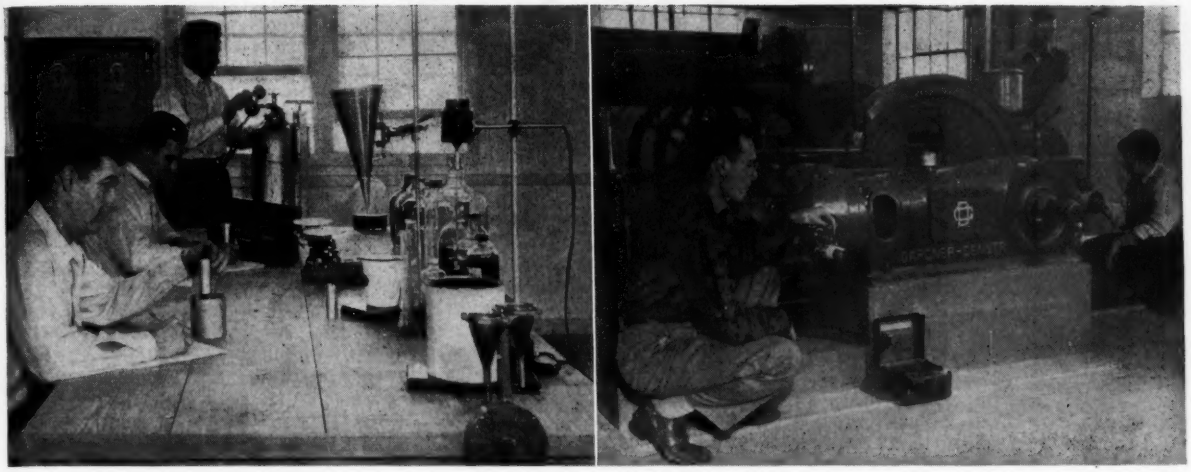


Knock-engine tests at a Texas Tech laboratory



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Practical Aspects Of Cycling

(Continued from page 112)

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In an appraisal of present worth under cycling or noncycling operations, the plant efficiency used in each case is most important and corrections should be made for:

(a) Variation in plant efficiency, under cycling due to injection gas dilution.

(b) Variation in plant efficiency under noncycling due to fluctuation in gas throughput.

The problems considered above, although complex, are simple indeed to the operator of a gas-condensate property compared to the one he must face after they have been solved. Unitization is required for satisfactory cycling operations due to the following reasons, both of which are all but unanimously recognized by the industry.

1. More barrels of liquid hydrocarbons and more dollars may be obtained from many gas-condensate fields by the application of cycling or other methods of pressure maintenance.

2. Pressure cannot be maintained in a gas-condensate reservoir without field-wide unitization unless the correlative rights of mineral owners are disregarded.

100 Per Cent Cooperation Essential

Field-wide unitization is only possible in some oil-producing states if 100 per cent of the mineral owners agree. Obviously, under this circumstance, a small minority of lease or royalty owners can prevent field-wide unitization regardless of the detrimental effect their inaction may have upon the income which could otherwise be recovered for the greater number of lease and royalty owners and the state, or the effect which the underground waste within the reservoir might have upon the national welfare.

It is paradoxical, indeed, that the law-making bodies of such states, which have charged their regulatory bodies with the responsibility of preventing waste, refuse at the same time to supply the mechanics by which the waste may be avoided without injuring the position of some mineral owners. Regulatory bodies, whose first responsibility is waste prevention, have no alternative where waste is indicated but to act, regardless of the effect upon correlative rights. Some inequities which exist today are a result of the failure of law-making bodies to recognize the need for such legislation.

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NO. 17 IN A SERIES

PETROLEUM ENGINEERING SCHOOLS

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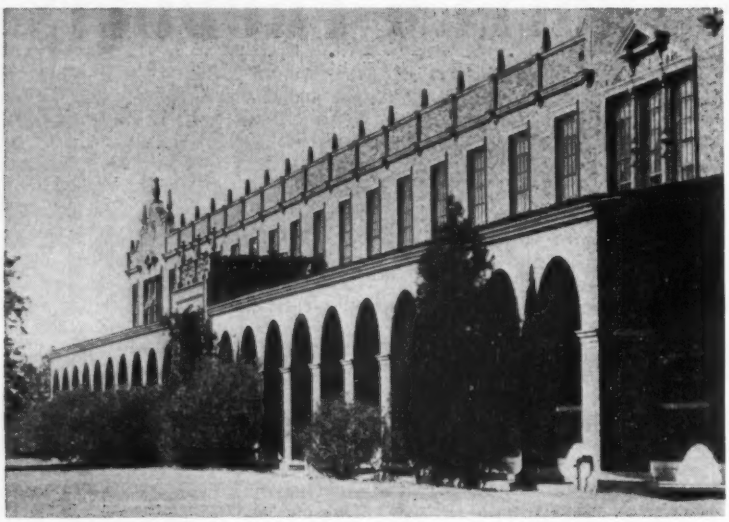

Main engineering building, Texas Technological College

SALIENT FACTS AND FIGURES

General.—Opened in 1925, Texas Technological College has experienced rapid growth. Current enrollment exceeds 6,000. Coeducational, state controlled and supported, the college is administered by a board of nine directors appointed by the governor. Dr. W. M. Whyburn is president. Graduate and undergraduate work is offered in the divisions of engineering, arts and sciences, agriculture, business administration, and home economics. Textile-engineering department is the only one of its kind west of the Mississippi River.

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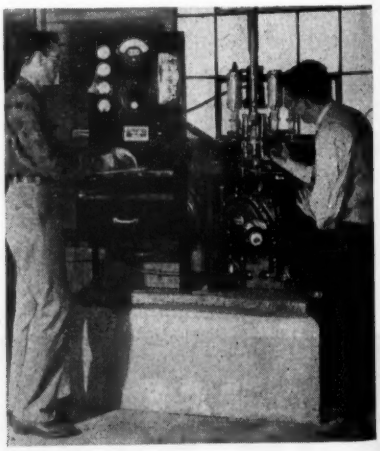

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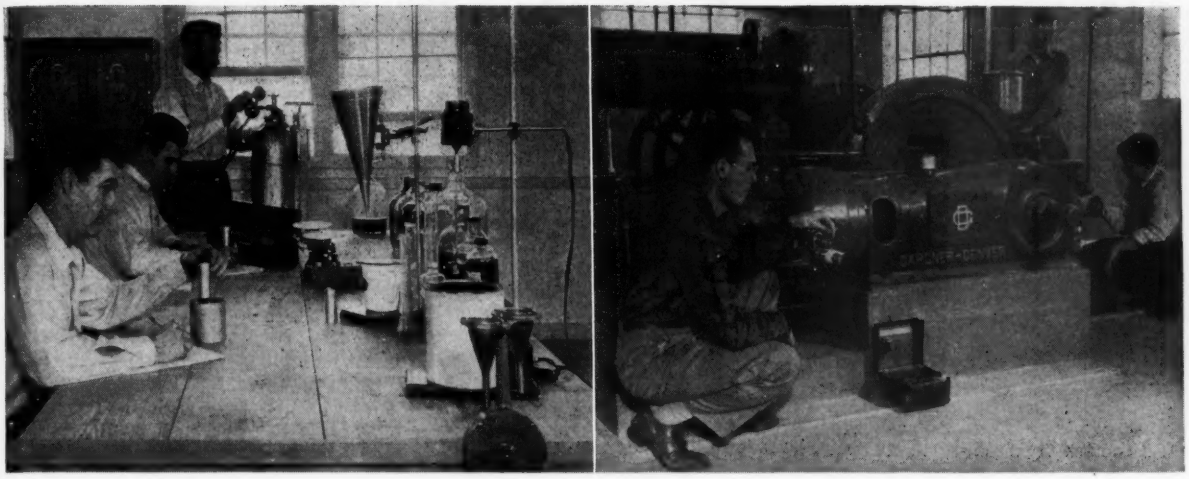

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QUESTIONS on TECHNOLOGY

by W. L. Nelson

Consulting Engineer

Cracking Temperature Of Hydrocarbons

Can you give me any information on the cracking temperature of petroleum molecules? I know that cracking starts at 625° F., and assume that different molecules must have different cracking temperatures.—J. G. F.

Although various temperatures such as 625°, 680°, and even 740° have been stated for various purposes as the temperatures at which cracking starts, it is probable that minor decomposition, or at least rearrangement, occurs at even lower temperatures but at extremely low rates.

The author held a lubricating-oil stock (pressed distillate) at temperatures of 300°-620° F. for 22 hours in the course of a series of distillations and redistillations and found that the heaviest fraction dropped in viscosity from 425 to 350 (Universal Saybolt at 100° F.), and the A.P.I. gravity increased from 28.8 to 29.4 (Petroleum Refinery Engineering, 2nd Ed., p. 318, McGraw-Hill Book Co., Inc., 1941). This may have been a decomposition or rearrangement at 620° F. and lower, or it may have occurred mainly in the film of liquid on the wall of the flask which was probably at a somewhat higher temperature. In addition, all plant men are aware of the discoloration that many oils undergo when heated to even 300° F.

The temperature of 625° F. that is so widely mentioned probably is derived from the fact that the vapor temperature in A.S.T.M. and similar distillations seldom exceeds 625° F. even though much higher-boiling material is present in the sample. However, when the vapor temperature registers 625° F. on the thermometer, the temperature of the liquid in the flask is at a very much higher temperature (perhaps over 740° F.) and hence, cracking is not taking place mainly at 625° F.

Finally, 680° F. is mentioned by many authorities as the temperature at which cracking starts. This concept probably arises because in conducting a distillation (either atmosphere or vacuum), a yellowish smoke or mist begins to appear in the vapor when the liquid temperature in the flask attains about 680° F. At the same time, the pressure in a vacuum distillation system tends to rise sharply indicating the formation of gases.

There is probably merit to all of these temperatures for their respective purposes. In other words, cracking or decomposition or rearrangement occurs at all temperatures above perhaps about 600° F. but the rate is so slow that the effect can hardly be detected at the lowest temperatures. Thus, the temperatures to produce various amounts of cracking (to gasoline) from several stocks or hydrocarbons are shown in Table 1. The values of Table 1 were read or computed from Fig. 94, page 306 of Petroleum Refinery Engineering.

The last column of Table 1 is probably most significant. It shows temperatures of 670°-840° F. for producing 0.01 per cent of gasoline during a minute. Thus, the oils or hydrocarbons would need to be held at these temperatures for about 1 hour and 40 minutes to produce 1 per cent of gasoline.

TABLE 1—APPROXIMATE TEMPERATURES REQUIRED TO PRODUCE CRACKING

	Percentage of gasoline produced per second			
Material—	0.001 (°F.)	0.01 (°F.)	0.1 (°F.)	0.01 (per minute) (°F.)
Residuums	722	795	870	670
Gas oil	730	800	875	675
Recycle stock	755	825	905	700
Naphthas	768	845	935	710
Hexane	788	860	950	730
Butanes	830	903	1,000	760
Propane	840	930	1,035	770
Ethane	905	1,005	1,120	840

Kinds of Solvents

We are confused by the many kinds of petroleum solvents. Can you classify solvents for us?—R.M.

Solvents and naphthas are used for so many purposes that there will always be a certain degree of confusion. The two most important properties are probably the boiling range (or volatility) and the dissolving (or solvent) power. In the order of boiling range, the grouping is as follows:

1. Petroleum ethers up to 175° F.
2. Intermediate solvents up to 320° F.
3. White spirits 300° to 400° F.
4. Kerosine or distillate 320° to 600° F.

There are, however, many solvents that do not fit exactly into the above classification. Twenty representative naphthas are listed on the Questions on Technology page of April 15, 1943 (pages 134-135). Uses, properties, names, distillation ranges, etc., are also indicated. Likewise, 24 solvents are listed and discussed by E. B. Evans on page 270 of the 1946 edition of Modern Petroleum Technology (Institute of Petroleum, Manson House 26, Portland Place, London).

With respect to safety in storage, solvents with flash points lower than about 160° F. (Tag) are considered to be dangerous. The British in their Petroleum (Consolidation) Act of 1928 classify solvents as "light hydrocarbon oil" if the Abel flash point is lower than 73° C., if the percentage distilled is more than 50 per cent at 185° C., or if more than 95 per cent distills at 240° C. Since most solvents boil below 460° F., the above classification rules that nearly all solvents are dangerous and must be taxed and handled accordingly.

Finally, solvents are classified according to their ability to dissolve cellulose esters and resins. Aromatic, and to some extent naphthenic hydrocarbons, have a high solvency power for such substances. Tests for solvency power have already been discussed on this page—*"Dilution Ratio Tests for V.M.& P. Naphtha," June 30, 1945, page 117, and "Nitrocellulose Dilution Ratio Procedure," July 12, 1947, page 70.*

The general significance of common physical properties are:

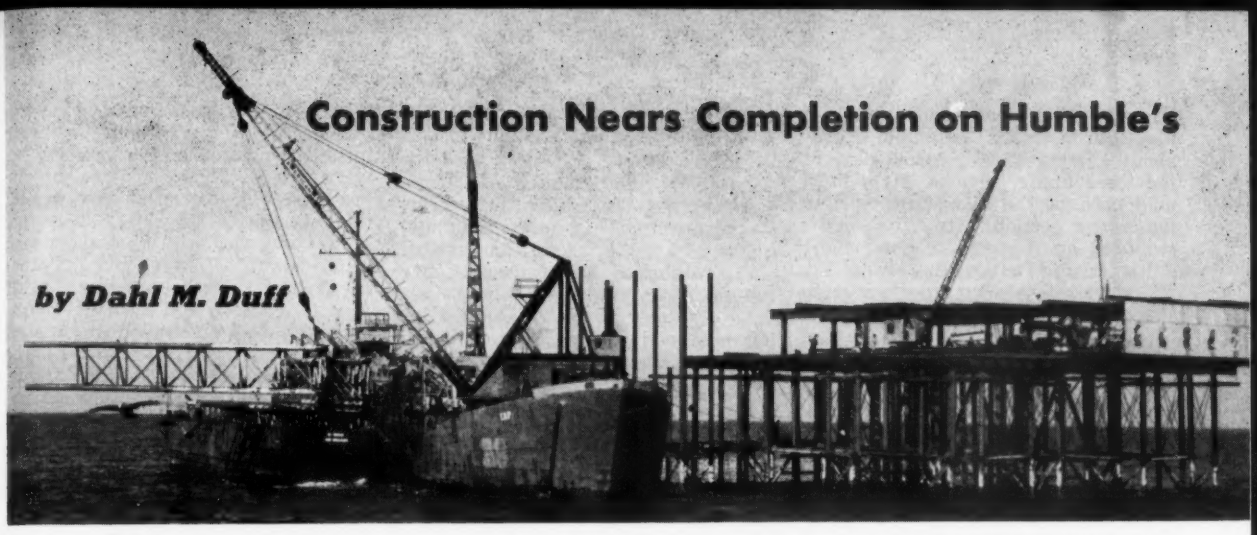
Specific gravity.—In itself not significant except with respect to freight charges which are rated on a basis of weight. Indirectly, it indicates the approximate chemical composition or amount or aromatic hydrocarbons present. Thus, high-specific-gravity or low-A. P. I.-gravity naphthas generally have a high solvent power for nitrocellulose lacquers.

Stability and odor.—Odor and the staining of fabrics by unstable naphthas are frequently important. To improve these properties, the solvents are sometimes treated with sulfuric acid and then redistilled. Odor is important for some seed extracting solvents, insecticide bases, and cleaners naphthas.

Flash point.—Except for high-boiling solvents such as Stoddards drycleaning naphtha (300°-400° F.), heavy distillate (400°-500° F.), mineral spirits (350°-450° F.), mineral colza (480°-660° F.), and wood preservatives (340°-650° F), the flash point of solvents is low and constitutes a fire hazard.

Viscosity and surface tension.—These are usually not important but they are generally related to ability to spread on the surface or prevade the stock. Wood-preservative bases must penetrate the wood and then spread through the fiber.

Volatility.—Obviously, the rate at which a solvent evaporates or dries from a material is frequently important.



Construction Nears Completion on Humble's GIANT Marine Drilling Platform

by Dahl M. Duff

General view of the platform as the work barge lifts one of the prefabricated templates off the transport barge. Driving of the piles at the left of the structure has not been completed. At the right of the platform is plywood siding enclosing the area between the two decks

THE largest drilling platform yet constructed in the Gulf Coast area is in the final stages of completion by Humble Oil & Refining Co. in 50 ft. of open water in the Gulf of Mexico 7 miles off Grand Isle, Jefferson Parish, Louisiana.

Construction of the structure is considered one of the most interesting engineering operations currently under way in the offshore drilling field. Depth of the water is nearly twice as great as any previously built platform on the Gulf Coast.

The Humble platform, with a gross weight for both structure and equipment of 5,000 tons, is designed to withstand winds up to 120 m.p.h., and wave height of 35 ft. The two decks measure 110 by 206 ft., and provisions are made for drilling up to seven holes from the one structure.

Humble started fabrication of the steel for the platform about a year ago. Months were spent studying soil mechanics, weather data, and supply problems, as well as the engineering considerations. First pile was driven November 30. Drilling operations are expected to commence probably this month.

The drilling "island" is supported on 100 H-beam piles driven through the tubular uprights of 25 templates. The templates are placed in four rows of four each, and three rows of three each.

The templates weigh 18 tons each, and are 72 ft. high. Distance between the center of the 16-in. casing used in the corners is 10 ft. For protection against the constant wave action, alternate layers of tar and Fiberglas, three each, coat approximately the upper half of the template members. Six-inch pipe is used as bracing.

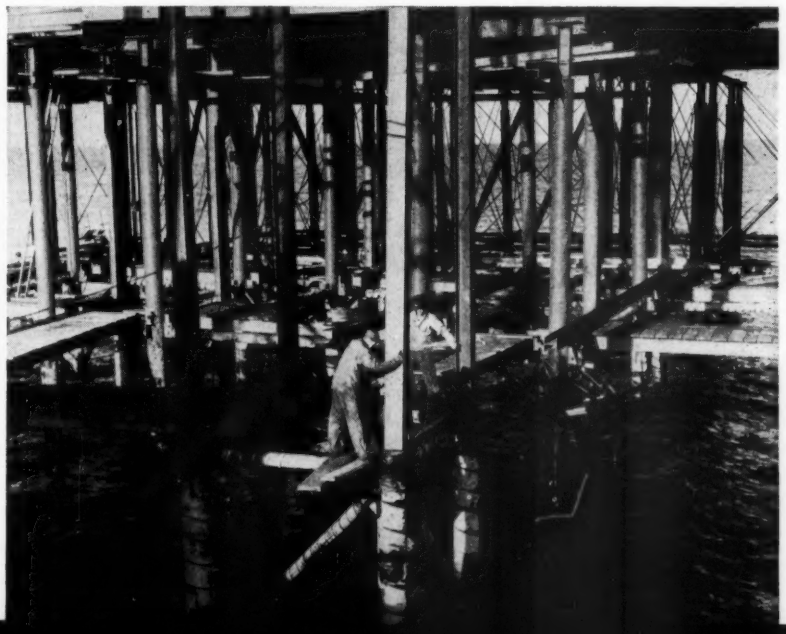
The templates were prefabricated in New Orleans by W. Horace Williams Co., who has the general construction contract, and barged to the location. When in place, they sink an average of 15 ft. below the top of the mud surface.

The Piling

The 10-in. H-beam piles, 57 lb. per foot, are in four sections, the lead section 120 ft. and the other three, 53 ft. 4 in. They are driven through the 16-in. template casing to between 147 and 197 ft. below the mud surface, the deepest penetrating to within 3 ft. of the first firm sand stratum.

The platform is supported entirely through the skin friction of the piling, and the 3-ft. clearance of the deepest pile allows uniform settling of the whole structure. Before commencing construction and to determine characteristics of the soil, six core-test holes, including one from a 24-in. test pile, were drilled to a maximum of 400 ft. Under the platform the soil is soft alluvial clay down to the sand level.

Average weight supported per pile is calculated at 100 tons with the deepest, 197-ft. pile under the mud storage and pipe rack taking 125 tons. The separate sections of each



The welder is ready to tack guide plates on the top of one of the template casings

XUM

pile are joined by means of lapwelded plates or "splices" extending down about 1 ft. from the lower part of the three upper sections. Eight bolts hold each of the two side plates to the lower section, while two bolts are used on the web section of the piling beam. Deformation from the pile driver is beaded up to provide a section-to-section bearing surface. In driving the H-beams through the 16-in. casing of the templates, two guide plates are welded on each side of the casing.

When driving is completed, the top section of the piling is welded to the template by means of four small plates which extend from the flanges of the H-beam pile to the wall of the template casing. These plates are 18 in. long. Half their length is welded to the piling and template; the remaining 9 in. guide a 16-in. sleeve which fits over the piling from its top to the top of the template.

After the completed pile is in and the sleeve in place, a plate is attached to the top of the pile, and the template and sleeve are filed with an alkaline solution to resist corrosion, then sealed. The templates are tied together at about 20 ft. by 8-in. pipe-connecting spacers. These are cut to size on the location, and held to template casing by plates and 2-in. pins.

Platform Decks

Upper of the two decks is 48 ft. above mean Gulf level with the derrick floor 60 ft. above. The top deck rests on 30-in. I-beams with 16-in. I-beams at right angles. The bottom deck, 34 ft. above the water, is supported on 24-in. I-beams with 12-in beams at right angles. Splined creosoted decking, topped by a wood floor, is used on each deck. The floor is designed for a maximum load of 500 lb. per sq. ft.

Equipment and installations on the top deck include: J 1250 Emsco draw works powered by two G.M. diesel quads of 1,200 hp. total, and a specially reinforced Emsco derrick; two 500-bbl. water tanks; Schlumberger unit; generator house; racks for drilling pipe and casing for a 15,000-ft. hole, and seven bedrooms and one office.

Protection on the seaward side of the bottom deck is provided by six water tanks and seven fuel-storage tanks of 215 bbl. each. The operating fuel tank is of 2,500-gal. capacity. Also on the lower deck are three Oil Well Supply Co. No. 20 mud pumps driven by G.M. diesel quad units of 500 hp. each; three 18 by 8 by 8-ft. mud tanks with gas-tight cover and vent; 6 by 12 mud-mixing pump; storage for 1,620,000 lb. of mud and cement; 11 bedrooms for 34 men; galley, dining, and recreation room, and cold-storage locker. Quarters are steam heated with complete sewage and water system and fan ventilation. There are electrical and diesel systems for fire fighting, as well as conventional foam and chemical extinguishers. Only combustible fuel allowed on the platform is the diesel fuel.

Among the features on the platform of special Humble design are the four personnel landing ramps located on all except the offshore side of the structure. These are pivoted below the lower deck and use a counterweight to maintain the platform-boat connection.

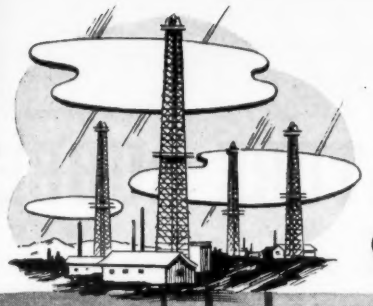
The marine fleet used by the company in connection with the offshore work is equipped with high-frequency radio, and radar is being installed in some of the vessels. The work barge which remains at the location is a converted Navy LST (landing ship, tank) 327 ft. in length. This is anchored with five cables each using two 1,000-lb. anchors. Cranes on the work barge are one No. 25 American 35-ton and a smaller Whirley No. 51. A crawler crane is mounted on the platform itself. The work barge, which carries construction equipment and welding machines, is removed at night several hundred feet from the platform.

The fleet also includes three converted LSMs (landing ship, mechanized) used as barges and two tugs, one a converted LCI (landing craft, infantry).

The entire Grand Isle offshore operation is planned for up to 2 weeks operation without resupply in case this becomes necessary. Heavier supplies, including drinking water, are barged from New Orleans, a 24-hour trip. Immediate base to support the offshore operation is on Grand Isle itself. Here Humble has 400 ft. of boat pens and docks on Bayou Rigaud and a 10-acre warehouse and office area on Grand Isle. Two harbors and a mile of channel have been dredged in Bayou Rigaud, and more than a mile dredged seaward from Barataria Pass.

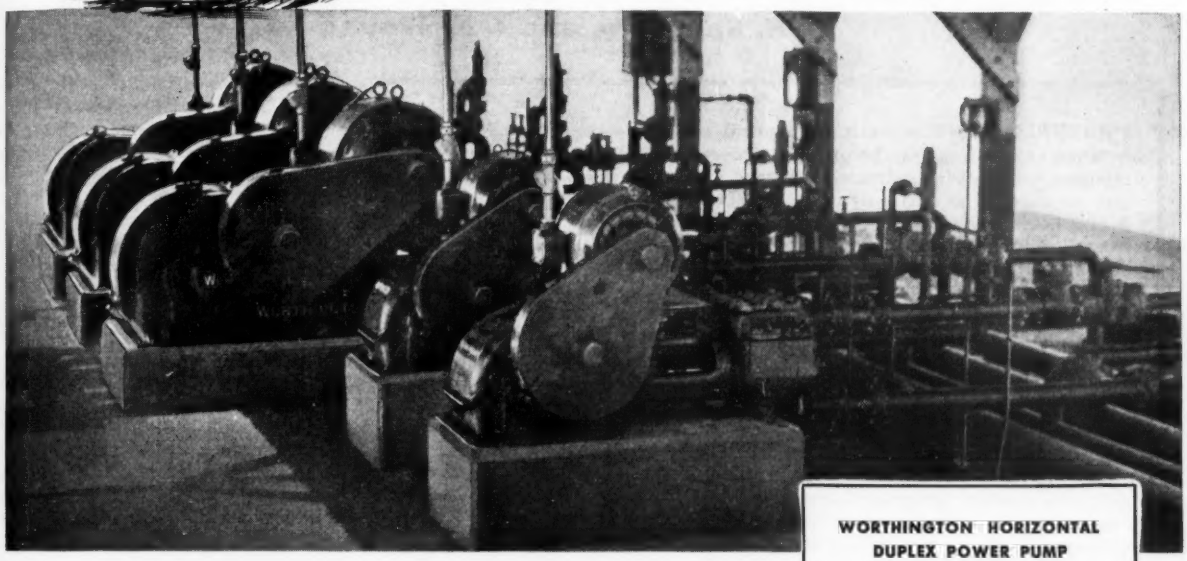
Two former Navy LST's are now undergoing conversion at Avondale Marine Ways, Inc., Westwego, La., for Humble. These ships will be completely equipped with all auxiliary machinery required for drilling purposes. Quarters for 59 will be provided including dining salons and sleeping accommodations.

Left: View of area under the platform floor, showing the floor beams and the sleeves fitting over the upper end of the piling. Right: Driving additional sections of piling; W. Horace Williams Co. of New Orleans has the general construction contract



First with ALL the Features

OIL MEN CONSIDER "MUSTS"



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Yes, Worthington Horizontal Duplex Power Pumps were the first to give oil men *all* the features they wanted for gathering service. But that's not the only reason they rate first choice in so many fields.

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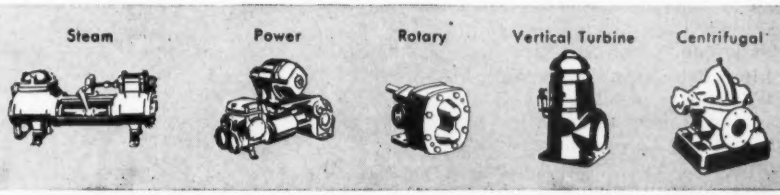

Properties of

PHILPRENE LOW-TEMPERATURE RUBBER

by W. A. Schulze, W. B. Reynolds, C. F. Fryling, L. R. Sperberg, and J. E. Troyan

PHILPRENE low-temperature chemical rubber has stimulated a great amount of interest in the physical properties of elastomers prepared in refrigerated emulsion systems. Philprene A is a butadiene-styrene copolymer manufactured at a polymerization temperature of 41° F. Philprene B is a butadiene-styrene copolymer manufactured in a methanol "antifreeze" polymerization system at a temperature of 14° F.

Phillips Petroleum Co. recently announced that these two types of low-temperature rubber are in production on pilot-plant scale at Phillips, Tex. In numerous recent tire tests the new product has outworn natural rubber. This article reports the physical properties of the Philprenes in various furnace-black and channel-black recipes. The authors are all associated with the research department of Phillips.

AT the inception of the American synthetic-rubber program there was no clear-cut evidence regarding the influence of many important process features of emulsion polymerization. In particular, very little was known concerning the effect of temperature of polymerization on polymer properties. In formulating the official "Mutual" recipe, a polymerization temperature of 122° F. was chosen, largely because that temperature gave a reaction rate of the correct order of magnitude with the particular recipe chosen. At that time, the temperature could not have been appreciably lower because no polymerization recipes were known which gave feasible rates at lower temperatures.

When the government research program got under way, the important process variables were more carefully evaluated. There were a number of indications during the period 1943 to 1945 that lowering the emulsion polymerization temperature improved the physical properties of chemical rubber. However, the lack of suitable low-temperature polymerization recipes made it impossible to commercialize low-temperature rubber at that time. Furthermore, the improvements shown at the polymerization temperatures examined were not striking enough to justify concerted effort directed toward the development of improved low-temperature recipes.

Phillips Petroleum Co. became interested in the possibilities of low-temperature rubber early in the program and in 1942 a pilot plant was designed which was capable of handling emulsion polymerizations at temperatures as low as 0° F. (—18° C.). This pilot plant was placed in operation in 1944.

Laboratory investigations of low-temperature polymerization utilized two general approaches, namely ferricyanide-activated diazo thio ether systems and iron-activated "redox" systems. Diazo thio ethers were introduced as polymerization initiators at University of Cincinnati and they were first used in ferricyanide-activated recipes at University of Minnesota. The work at both universities was carried out under the auspices of the Office of Rubber Reserve, Reconstruction Finance Corp.

Redox systems were described in patents assigned to B. F. Goodrich Co., for which applications were filed in 1941. Apparently independently, the Germans also developed redox recipes. Important contributions toward the development of practical redox systems were made from University of Minnesota and, in particular, the Minnesota group introduced the use of organic hydroperoxides as the oxidant in redox recipes.

Privately financed research in the Phillips laboratories and pilot plant

TABLE 1—STRESS-STRAIN PROPERTIES OF PHILPRENE A AND GR-S 10 IN A PHILBLACK O TREAD RECIPE

Rubber—	Min. cure at 307° F.	Psi. at 80° F. 300%	Psi. at 80° F. Break	Psi. at 80° F. Elongation	Psi. at 200° F. 300%	Psi. at 200° F. Break	Psi. at 200° F. Elongation
CHP Philprene A	10	380	1,670	805	....	....	....
	20	1,110	3,790	660	1,220	1,800	420
	30	1,500	3,800	570	....	....	....
	45	1,620	4,000	550	1,720	1,900	320
	75	1,700	4,000	525	....	....	....
GR-S 10	10	390	1,210	645	....	....	....
	20	1,170	2,420	500	1,280	1,290	305
	30	1,490	2,690	455	....	....	....
	45	1,580	2,600	425	....	1,320	240
	75	1,650	2,810	440	....	....	....

TABLE 2—HYSTERESIS PROPERTIES OF PHILPRENE A AND GR-S 10 IN A PHILBLACK O TREAD RECIPE

Rubber—	Min. cure at 307° F.	Original Heat rise, ΔT °F.*	Original Per cent Perm. set	Original Resilience†	Oven aged 24 hr. at 212° F. Heat rise, ΔT °F.*	Oven aged 24 hr. at 212° F. Per cent Perm. set	Oven aged 24 hr. at 212° F. Resilience†
Philprene A	30	71.5	3.4	62	60	0.4	67
	45	65.8	1.6	64	61	0.6	66
GR-S 10	30	77.6	5.0	58	67	0.9	63
	45	74.0	2.6	58	67	1.0	63

*Goodrich Flexometer, 0.175-in. stroke, 143-psi. load, 100° F. Circulating air oven, 15-minute test time. †Yerzley Oscillograph (at 80° F.).

TABLE 3—FLEX LIFE, SHORE HARDNESS, AND COMPRESSION SET FOR PHILPRENE A AND GR-S 10 IN A PHILBLACK O TREAD RECIPE

Rubber—	Min. cure at 307° F.	Original Flex life M flexures*	Original Shore hardness	Original Compression set	Oven aged 24 hr. at 212°F. Flex life M flexures*	Oven aged 24 hr. at 212°F. Shore hardness	Oven aged 24 hr. at 212°F. Compression set
Philprene A	30	18	63	29	5	68	6.4
	45	11	64	16	7	67	5.4
	75	11	64	9.2	8	66	5.0
GR-S 10	30	3	60	27	3	65	7.2
	45	3	61	15	4	65	6.7
	75	3	61	8.2	3	63	5.8

*Three-in. stroke DeMattia Flexometer at 210° F.

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has led to the development of exceedingly rapid polymerization systems suitable for large-scale production of low-temperature rubber, and low-temperature rubber has been in pilot-plant production at Phillips, Tex., for well over a year.

The Philprenes

Philprene A* is the name applied to Phillips' chemical rubber produced at a polymerization temperature of 41° F. (5° C.). It is a butadiene-styrene copolymer containing approximately 24 per cent bound styrene. The finished rubber preferably contains about 5 per cent disproportionated rosin acid and in that respect is comparable with GR-S 10. Vulcanizates of Philprene A are characterized by high tensiles both at normal and elevated temperatures, high resilience, high flex life, good abrasion resistance, and exceptionally good processing characteristics. Although the properties of Philprene A are not limited to a particular type of carbon-black reinforcement, especially good results are obtained through the use of high-abrasion furnace black. The physical properties of Philprene A in a typical Philblack O compound are compared with those of GR-S 10 in Tables 1, 2, and 3.

The processability of the Philprene A compound given here is superior to that of GR-S 10. Laboratory extrusion tests through a Garvey die indicate a

COMPOUND	Parts
Elastomer	100
Philblack O	45
Zinc oxide	3
Stearic acid	2
Agerite	1.2
Sulfur	1.75
Santocure	0.95
Circo oil	2.75
Paraflux	2.26

faster extrusion and a smoother specimen. Factory processing of Philprene A has also indicated superior processability. In one tire factory the technical staff rated 60 Mooney CHP Philprene A as 25 per cent superior to GR-S 10 in over-all processing characteristics. The processing characteristics permit compounding Philprene A at low softener levels for maximum tread wear. Even at low softener levels Philprene A tires have good cracking and cut-growth characteristics, particularly when compounded with Philblack O.

Philprene B* is the name applied to Phillips' chemical rubber produced at a polymerization temperature of 14° F (—10° C.). It also is a butadiene-styrene copolymer containing approximately 24 per cent bound styrene. Various embodiments of Philprene B contain fatty acid, disproportionated rosin acid or mixtures thereof, depending upon requirements. The physical properties of Philprene B are generally superior to

*A trademark of Phillips Petroleum Co.

TABLE 4—STRESS-STRAIN PROPERTIES OF PHILPRENE B AND GR-S IN A PHILBLACK O TREAD RECIPE

Rubber—	Min. cure at 307° F.	Psi. at 80° F. 300%	Psi. at 80° F. Break	Psi. at 80° F. Elongation	Psi. at 200° F. 300%	Psi. at 200° F. Break	Psi. at 200° F. Elongation
Philprene B	10	550	2,600	790	....	....	....
	20	1,160	3,680	660	1,110	2,130	515
	30	1,370	3,490	565	....	....	....
	45	1,460	3,740	575	1,450	2,100	390
	75	1,470	3,900	590	....	....	....
GR-S (X-346)	10	730	2,150	640	....	....	....
	20	1,500	2,670	470	....	1,340	295
	30	1,660	3,180	500	....	....	....
	45	1,680	3,140	485	....	1,420	260
	75	1,620	2,840	450	....	....	....
		Oven aged 24 hr., 212° F.					
Philprene B	10	2,370	3,470	410	....	....	....
	30	2,300	3,620	440	....	....	....
	75	1,860	3,490	465	....	....	....
GR-S (X-346)	10	2,560	2,960	340	....	....	....
	30	2,560	3,090	350	....	....	....
	75	2,110	2,930	400	....	....	....

TABLE 5—HYSTERESIS PROPERTIES OF PHILPRENE B AND GR-S IN A PHILBLACK O TREAD RECIPE

Rubber—	Min. cure at 307° F.	Original: Heat rise, ΔT °F.*	Original: Per cent Perm. set	Original: Resilience†	Oven aged 24 hr. at 212° F.: Heat rise, ΔT °F.*	Oven aged 24 hr. at 212° F.: Per cent Perm. set	Oven aged 24 hr. at 212° F.: Resilience†
Philprene B	30	78.7	4.8	62	71.5	0.8	66
	45	77.7	2.4	63	73.3	1.0	65
GR-S (X-346)	30	74.2	4.4	58	67.5	0.7	65
	45	73.5	2.3	58	68.5	0.8	64

*Goodrich Flexometer—oven temperature 100° F. †Yerzley Oscillograph at 80° F.

TABLE 6—FLEX LIFE, SHORE HARDNESS, AND COMPRESSION SET FOR PHILPRENE B AND GR-S IN A PHILBLACK O TREAD RECIPE

Rubber—	Min. cure at 307° F.	Original: Flex life M flexures*	Original: Shore hardness	Original: Compression set	Oven aged 24 hr. at 212°F.: Flex life M flexures*	Oven aged 24 hr. at 212°F.: Shore hardness	Oven aged 24 hr. at 212°F.: Compression set
Philprene B	30	56.0	62	20.7	11.2	66	8.0
	45	26.0	63	14.2	9.7	64	7.4
	75	45.0	63	10.1	13.9	63	7.5
GR-S (X-346)	30	7.9	62	22.6	6.5	67	7.5
	45	7.5	63	14.2	5.0	66	7.6
	75	8.9	64	9.5	4.0	66	6.8

*DeMattia Flexometer—3-in. stroke at 210° F.

TABLE 7—STRESS-STRAIN PROPERTIES OF PHILPRENE B AND GR-S IN A CHANNEL-BLACK TREAD RECIPE

Rubber—	Min. cure at 307° F.	Psi. at 80° F. 300%	Psi. at 80° F. Break	Psi. at 80° F. Elongation	Psi. at 200° F. 300%	Psi. at 200° F. Break	Psi. at 200° F. Elongation
Philprene B	20	840	4,000	710	740	2,270	640
	30	1,090	4,640	680	....	....	....
	45	1,260	4,510	640	1,040	1,880	445
	75	1,240	4,630	650	....	....	....
GR-S (X-346)	20	760	2,690	700	640	890	365
	30	1,150	3,380	620	....	....	....
	45	1,330	3,370	585	....	1,110	275
	75	1,400	3,310	555	....	....	....
		Oven aged 24 hr., 212° F.					
Philprene B	30	2,100	3,900	460	....	....	....
	75	1,780	4,360	560	....	....	....
GR-S (X-346)	30	2,070	2,600	360	....	....	....
	75	1,840	3,100	460	....	....	....

TABLE 8—HYSTERESIS PROPERTIES OF PHILPRENE B AND GR-S IN A CHANNEL-BLACK TREAD RECIPE

Rubber—	Min. cure at 307° F.	Original: Heat rise, ΔT °F.*	Original: Per cent Perm. set	Original: Resilience†	Oven aged 24 hr. at 212° F.: Heat rise, ΔT °F.*	Oven aged 24 hr. at 212° F.: Per cent Perm. set	Oven aged 24 hr. at 212° F.: Resilience†
Philprene B	30	70.2	3.2	66	61.4	0.8	70
	45	66.5	3.0	68	63.5	1.0	70
GR-S (X-346)	30	77.3	6.8	57	62.0	0.6	65
	45	71.0	2.4	59	61.7	0.7	65

*Goodrich Flexometer—oven temperature 100° F. †Yerzley Oscillograph at 80° F.

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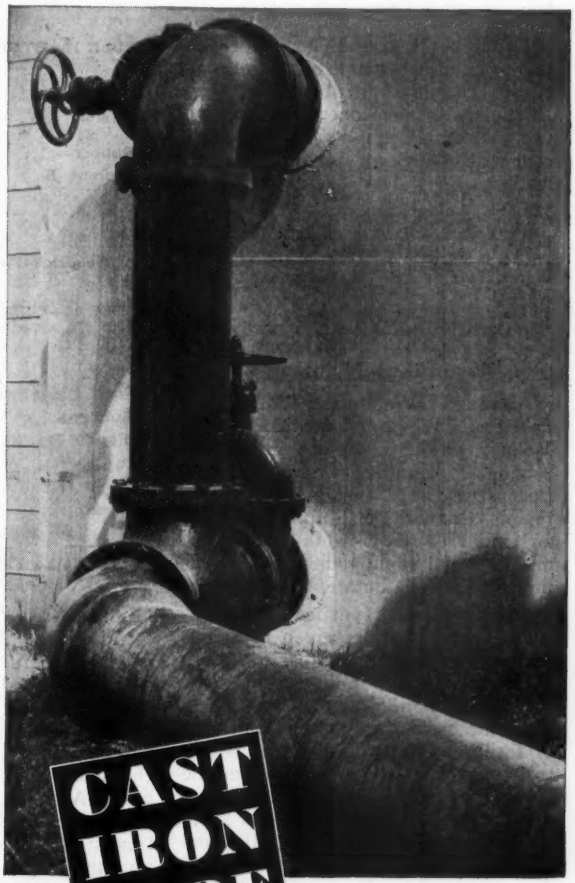

Cast Iron Pipe Research Association, Thomas F. Wolfe, Research Engineer, 1015 Peoples Gas Bldg., Chicago 3, Illinois

those of Philprene A. In addition to excellent properties exhibited in tread recipes, Philprene B shows interesting properties in carcass recipes at lower black loadings.

COMPOUND

	Parts
Elastomer	100
Philblack O	50
Zinc oxide	3
Asphalt No. 6	10
Sulfur	1.75
Santocure	0.80

Tables 4 to 16 present the physical properties of Philprene B in various furnace and channel-black tread and carcass recipes. Tables 4, 5, and 6 compare Philprene B with GR-S in a typical Philblack O tread recipe.

Tables 7, 8, and 9 compare Philprene with GR-S in a typical channel-black tread recipe.

COMPOUND

Philprene B	*100	.....
GR-S (X-346)	.....	†100
Wyex (No. 1)	50	50
Zinc oxide	3	3
Sulfur	1.75	1.75
Santocure	1.20	1.20
Asphalt No. 6	10	10
Disp. rosin acid	1	.....

*Contained 2 per cent fatty acid. †Contained 5 per cent fatty acid.

Philprene B appears to be of particular interest for use in tire carcasses. The data of Tables 10, 11, and 12 illustrate the properties to be expected from Philprene B in comparison with GR-S at low Philblack O loadings.

COMPOUND

Elastomer	100
Philblack O	25
Zinc oxide	3.0
Asphalt No. 6	10.0
Sulfur	1.75
Santocure	1.25

Unmodified Philprene B

Although the standard Philprene B described above is modified to a Mooney value of 65, an interesting product is obtained when no modifier is used in the polymerization recipe. Unmodified Philprene B has an initial Mooney value (>150) but breaks down rapidly upon milling as indicated by the data of Table 13.

The physical properties of unmodified Philprene B are given in Tables 14, 15, and 16, in comparison with GR-S. The compounding recipe used was for a channel-black tread stock.

On the basis of numerous road tests of Philprene A tires on Phillips Petroleum Co. test vehicles, it can be stated that the abrasion resistance (tread wear) of Philprene A is 20 to 40 per cent superior to GR-S 10. Normally, an improvement in tread wear is accomplished only at the expense of poor cracking and cut-growth characteristics. However, the good hysteresis-flex life characteristics of Philprene A shown in Tables 2 and 3 are reflected in excellent cracking and cut-growth characteristics of Philprene A tires. These comments apply to Philprene A treads when either channel or furnace black reinforcement is utilized. However, when HAF (high abrasion furnace) black reinforcement is used, a marked improvement in the tread wear and cracking characteristics of both GR-S and Philprene A is obtained. Also, it can be stated positively that Philprene A treads reinforced with Philblack O are superior in both tread wear and cracking characteristics to first-line natural rubber treads.

Philprene B was developed and manufactured on a pilot-plant scale at a somewhat later date than Philprene A; consequently, there has not yet been sufficient time for building and extensive testing of tires. However, the good physical properties suggest that this product will also be of outstanding value in tire treads. The properties of Philprene B at low

TABLE 9—FLEX LIFE, SHORE HARDNESS, AND COMPRESSION SET FOR PHILPRENE B AND GR-S IN A CHANNEL-BLACK TREAD RECIPE

		Original			Oven aged 24 hr. at 212° F.		
Rubber—	Min. cure at 307° F.	Flex life M flexures*	Shore hardness	Compression set	Flex life M flexures*	Shore hardness	Compression set
Philprene B	30	22.0	62	22	7.0	66	8.5
	45	25.0	62	14	5.9	65	8.2
	75	23.0	62	11	7.6	65	8.0
GR-S (X-346)	30	4.5	61	31	3.8	66	9.2
	45	6.4	62	19	4.5	66	8.2
	75	7.1	63	10	3.6	65	7.2

*Three-in. stroke DeMattia Flexometer at 210° F.

TABLE 10—STRESS-STRAIN PROPERTIES OF PHILPRENE B AND GR-S IN A PHILBLACK O CARCASS RECIPE

		Psi. at 80° F.			Psi. at 200° F.		
Rubber—	Min. cure at 307° F.	300%	Break	Elongation	300%	Break	Elongation
Philprene B	10	350	3,520	900	....	....	....
	20	600	3,740	700	630	790	340
	30	630	3,700	680	....	....	....
	45	670	3,700	680	....	670	290
	75	610	4,060	730	....	....	....
GR-S	10	460	2,960	865	....	....	....
	20	760	3,040	645	....	470	210
	30	850	3,000	600	....	....	....
	45	810	2,819	590	....	530	230
	75	760	2,710	600	....	....	....
		Oven aged 24 hr., 212° F.					
Philprene B	10	1,210	2,760	490	....	....	....
	30	1,000	2,670	525	....	....	....
	75	710	2,880	640	....	....	....
GR-S	10	1,520	1,740	335	....	....	....
	30	1,370	2,120	395	....	....	....
	75	990	2,470	505	....	....	....

TABLE 11—HYSTERESIS PROPERTIES OF PHILPRENE B AND GR-S IN A PHILBLACK O CARCASS RECIPE

		Original			Oven aged 24 hr. at 212° F.		
Rubber—	Min. cure at 307° F.	Heat rise, ΔT °F.*	Per cent Perm. set	Resilience†	Heat rise, ΔT °F.*	Per cent Perm. set	Resilience†
Philprene B	30	41.0	0.6	75	40.4	0.5	78
	45	41.7	0.6	74	41.3	0.6	77
GR-S	30	47.2	1.4	71	41.3	0.5	76
	45	47.8	1.2	71	43.2	0.6	75

*Goodrich Flexometer—oven temperature 100° F. †Yerzley Oscillograph at 80° F.

TABLE 12—FLEX LIFE, SHORE HARDNESS, AND COMPRESSION SET FOR PHILPRENE B AND GR-S IN A PHILBLACK O CARCASS RECIPE

		Original			Oven aged 24 hr. at 212° F.		
Rubber—	Min. cure at 307° F.	Flex life M flexures*	Shore hardness	Compression set	Flex life M flexures*	Shore hardness	Compression set
Philprene B	30	3.0	52	16.8	0.5	53	6.6
	45	3.8	52	11.1	0.5	52	5.7
	75	2.6	53	8.7	1.1	52	5.6
GR-S	30	1.6	51	19.3	0.1	55	6.5
	45	1.2	52	13.9	0.1	53	5.8
	75	0.6	53	9.2	0.3	53	5.7

*DeMattia Flexometer—3-in. stroke at 210° F.

TABLE 13—MILL BREAKDOWN CHARACTERISTICS OF UNMODIFIED PHILPRENE B

Cold milled, minutes at setting of 0.04 in.	Inherent viscosity	Per cent Gel	Swelling index
0	2.08	68	44
1	2.32	46	55
2	2.66	31	64
4	2.66	10	134
6	2.22	0	..
10	1.58	0	..
15	1.35	0	..
20	1.18	0	..
30	1.13	0	..

TABLE 14—STRESS STRAIN PROPERTIES OF UNMODIFIED PHILPRENE B AND GR-S IN A CHANNEL-BLACK TREAD RECIPE

Rubber—	Min. cure at 307° F.	Psi. at 80° F. 300%	Psi. at 80° F. Break	Per cent elongation
Unmodified Philprene B	20	1,720	6,000	580
	30	2,170	6,000	585
	45	2,160	5,520	480
	75	2,240	5,520	465
GR-S (X-224)	20	960	3,170	710
	30	1,210	3,600	625
	45	1,520	3,720	560
	75	1,600	3,850	515

TABLE 15—HYSTERESIS PROPERTIES OF UNMODIFIED PHILPRENE B AND GR-S IN A CHANNEL-BLACK TREAD RECIPE

		Original			Oven aged 24 hr. at 212° F.		
Rubber—	Min. cure at 307° F.	Heat rise, ΔT °F.*	Per cent Perm. set	Resilience†	Heat rise, ΔT °F.*	Per cent Perm. set	Resilience†
Unmod. Philprene B	30	53.4	0.6	74	48.2	0.1	80
	45	52.6	0.4	75	48.6	0.3	78
GR-S (X-224)	30	77.8	5.2	59	59.8	0.3	68
	45	71.6	1.8	62	62.8	0.6	67

*Goodrich Flexometer—oven temperature 100° F. †Yerzley Oscillograph at 80° F.

TABLE 16—FLEX LIFE, SHORE HARDNESS, AND COMPRESSION SET FOR UNMODIFIED PHILPRENE B AND GR-S IN A CHANNEL-BLACK TREAD RECIPE

		Original			Oven-aged 24 hours at 212° F.	
Rubber—	Min. cure at 307° F.	Flex life M flexures*	Shore hardness	Compression set	Flex life M flexures*	Shore hardness
Unmodified Philprene B	30	21	59.5	17.7	4.5	69
	45	11	60.5	9.4	11.0	67.5
	75	15	61	7.7	...	...
GR-S (X-224)	30	19	55.5	35.4	9.1	65.5
	45	10	56	18.7	13	66
	75	13	57	9.6	...	...

*DeMattia Flexometer—2-in. stroke at 210° F.

black loadings suggest its potential use in tire-carcass stocks.

The properties of Philprene low-temperature rubber suggest many applications in the latex, wire and cable, and mechanical-goods industries. Obviously, still other uses will be established as more experience is gained in handling these new synthetic products which have already attracted so much interest.

Synthetic Alcohol From Petroleum

(Continued from page 110)

leaving the hydrolizer consists of a mixture of ethyl alcohol, ethyl ether, sulfuric acid, and water, together with a trace of carbonaceous and other organic material formed as by-products of the operation. This stream passes to a stripping column in which the alcohol and ether are stripped out, leaving a residue of sulfuric acid and water of about 50 per cent strength. The alcohol and ether vapors from the top of this stripping column pass to a scrubber in which they are washed with water or caustic. Steam is introduced into the base of this scrubbing in order to recover alcohol from the descending scrubbing liquor.

The vapors leaving the scrubber are condensed and cooled for purification and concentration in the finishing section of the unit. In this section the feed is first introduced into an ether column in which the ether is stripped from the dilute alcohol, concentrated in the top of the column, and back washed with water to remove final traces of alcohol. The ether-free alcohol from the base of the stripper passes to a rectifying column where the concentration of alcohol is raised to approximately 95 per cent on a volume basis. Oils are drawn from an intermediate point in the column. The overhead product may then be further concentrated by stripping out additional heads materials at high proof.

Acid from the base of the stripping column passes to a preboiler in which the acid concentration is raised to approximately 70 per cent, and vapor is provided for use in the base of the stripping column. This acid is then heated to accelerate carbon formation in the residual organic matter, oil material is decanted, and carbon is filtered out. The acid then passes to the acid concentrators in which water is removed by distillation under high vacuum, using Dowtherm (diphenyl and diphenyl oxide) as a heating medium. The concentrated sulfuric acid (94.5 per cent) can then be reused for the absorption.

Conclusions

The manufacturing costs of producing synthetic ethanol from ethylene under American conditions are less than 10 cents per gallon. This would include fixed charges, plus operating costs such as labor, maintenance, and utilities. Credits for the H_2SO_4 and ethyl ether have also been allowed in the above figure. The ethylene cost, which should be added, will depend upon the specific conditions involved. If byproduct ethylene is used, the costs would vary to a large extent in accordance with the bookkeeping methods. In the case of a cracking unit directed towards organic chemical production, if crude oil were to cost $2 per barrel, and if the isopropanol and other chemicals are made as joint products, the total cost of the ethanol would be less than 15 cents per gallon. It is believed that the total costs of making alcohol by direct catalytic hydration will be of the same order. These costs compare very favorably with the costs of producing ethanol from grain and from blackstrap molasses. The prices of these agricultural commodities vary with the business cycle, but in general the price of grain far exceeds the necessary limit for economic production of industrial alcohol in countries where petroleum is available, while molasses could only serve as a marginal source during periods of low sugar prices. However, national and international considerations sometimes may modify these remarks, even in countries which have abundant petroleum resources.

The production of synthetic alcohol is another example of the application of sound chemical engineering techniques to the practical solution of an important industrial problem. The difficulties encountered in the numerous operations involved are indicative of the complexities of modern industrial processes which the chemical engineer has to design and operate. Similarly, the recovery of the byproduct alcohol from Synthol (Fischer-Tropsch) plants which at present gives rise to some problems, will be solved, making it an important process for organic chemicals manufacture.

Vickers Petroleum Buys New Mexico Properties

Vickers Petroleum Co., Inc., Wichita, has purchased for more than $750,000, 1,200 acres of oil producing property in the Caprock pool of Chaves and Lea counties in southeastern New Mexico from Malco Refineries, Inc., Roswell, N. M.

The Malco properties consist of 520 acres of proven area with 13 wells on a 40-acre spacing and 680 acres of semiproved locations and offsets to other wells.

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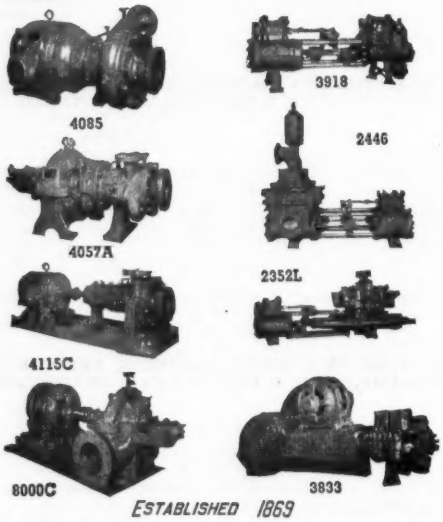

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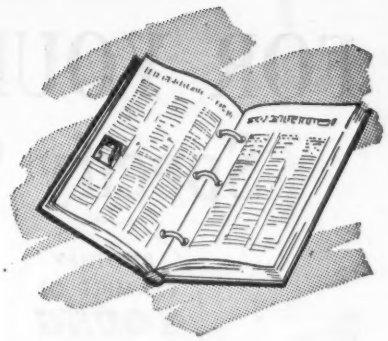
Tulsa 1, Oklahoma

The Refiner's Notebook

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL



Threaded Joints

MOST difficulties with poor pipe threads or faulty pipe joints are caused by the following four general factors:

1. Joints are pulled up too tightly.
2. Insufficient lubricant during cutting or during setting of joint.
3. Length of threaded portion is too short.
4. Faulty threads (dirty or dull tools, insufficient lubricant, end of pipe not cut off square before threading, etc.).

According to Crane Co., the pull required to make a satisfactorily tight joint between American standard taper pipe threads is as follows:

Pipe size (in.)	Ft.-Lb.	Example of pull required:
⅛	10	15 lb. on 8-in. handle
¼	20	24 lb. on 10-in. handle
⅜	32	24 lb. on 10-in. handle
½	45	34 lb. on 16-in. handle
¾	65	32 lb. on 24-in. handle
1	95	48 lb. on 24-in. handle
1¼	130	52 lb. on 30-in. handle
1½	180	60 lb. on 3-ft. handle
2	260	87 lb. on 3-ft. handle
2½	360	90 lb. on 4-ft. handle
3	460	115 lb. on 4-ft. handle
3½	600	120 lb. on 5-ft. handle
4	700	117 lb. on 6-ft. handle
4½	850	142 lb. on 6-ft. handle
5	900	150 lb. on 6-ft. handle
6	1,100	184 lb. on 6-ft. handle
7	1,440	240 lb. on 6-ft. handle
8	1,560	260 lb. on 6-ft. handle

The second column is the real figure. The number shown is the product of the length of the handle or level (in feet) and the extent of the pull (in pounds). Thus, for the first example, the 10-ft.-lb. pull could be attained with a pull of 10 lb. on a 12-in. wrench, as well as by the 15-lb. pull on an 8-in. wrench which is shown in the table. At first glance the pulls shown in the last column (or the handle length) seem large, but experience fitters universally "snap" or "set" the joint by a rapid or sharp pull or jerk which results in a pull greater than the weight of the man. Freshly cut and clean threads can be pulled up by hand (no wrench) to within one or two turns of tight. After being set tight, the joint can usually be pulled to the extent of two or three more turns but this does not make a tighter joint and in fact, may cut or damage the threads, the male fitting may be swaged down, the joint may become frozen, and in extreme cases cast iron or malleable iron joints may be cracked.

To cut good threads (1) use plenty of oil, (2) center the cutting die accurate, (3) use a wrench to tighten the thumb screws that hold the cutter on the pipe, (4) clear slots of dirt, gummy oil, and chips when changing chasers, (5) be sure the end of the pipe is cut off square before threading, and (6) cut a full-length thread.

The extent of gas leaks from joints can be judged in some degree by the noise produced (Refiner's Notebook No. 177, January 1, 1948, p. 69). E. N. Kemler finds that leaks are caused almost totally by improper makeup of the joint (A.P.I. meeting, Chicago, November 13, 1946).

CORRECTION OF PIPE-THREAD FAULTS (HAND THREADING)

(As outlined by the A. M. Byers Co. of Pittsburgh, Pa.)

Appearance of threads	Look for	Correction
ROUGH THREADS (broken chipped, or torn)	Dull chasers (Check by inspection)	Sharpen
	Insufficient lubrication (This not only makes poor threads but damages chasers)	Use plenty of good oil (sulfur-base threading oil plus little lard oil gives good results)
	Improper lead shape (Usually due to improper grinding)	Grind properly
	Excessive or insignificant lead cutting angle	Grind to correct angle
	Broken tooth in chaser	Grind out entire tooth
	Chasers not set to form true cutting circle	Clean slot-set chasers to true cutting circle-grind chasers to make them of uniform length
SHAVED THREADS (threads nearest end almost worn off)	Improper lead of chaser	Regrind
	Chasers not tracking properly	Keep slots clean
	Chasers not set in due rotation	Correct setting
WAVY THREADS (threads not straight)	Die or chasers not set true	Center die or chasers
	Thumb screws not tight	Tighten screws with wrench
	Worn-out lead screws	Get new die stock
	Cuttings or dirt in chaser slots	Keep slots always clean
SHOULDERS (threading appears not to be centered on the pipe)	Pipe ends not square (die starts on same angle as end cut, and threads diagonally. This trouble is often wrongly blamed on "out-of-round" pipe)	Cut pipe end square to axis of pipe and rethread

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XUM

ENGINEERING fundamentals

No. 325

Capillary Forces—Surface Tension

THE forces which express the molecular action between the various solid, liquid, and gas phases in a reservoir are called capillary forces. They are so named because one of the most obvious manifestations of their existence is the behavior of a liquid within a capillary tube. The present discussion will outline the basic terms necessary for an understanding of these forces.

At the boundary between any two phases (that is, between liquid and gas, liquid and liquid, or liquid and solid) there is an unbalance of molecular forces, the net result of which is to tend to contract the boundary area to a minimum value. Consider an amount of water in a vessel. An average molecule within the body of the water will be uniformly attracted in all directions by other molecules. However, a molecule in the surface has no water molecules above it, and thus the resultant force tends to attract the surface molecule into the liquid. Looking at this from another standpoint, every new molecule put into the surface area would require that work be done on it. To create a new unit of area of surface would require an amount of work done comparable to the number of molecules in the unit area. The amount of work in ergs which must be done to create 1 sq. cm. of a surface is termed the **surface energy** of the substance.

A term which is used more commonly than surface energy is **surface tension.** This is known as the force in dynes acting in the surface perpendicular to a line of 1 cm. length and for a distance of 1 cm. in order to produce the new uit area of surface. It is, therefore, numerically equal to the surface energy. The term surface tension is usually reserved for the tension in the surface of a liquid which is in contact with its vapor or with air. If the surface is that between two liquids or between a liquid and a solid, the term interfacial tension is used. The surface tension of water is 72.6 dynes per centimeter. Table 1 lists

Table 1—Surface Tensions at 20° C.

Substance	Surface Tension
Benzene	28.9 dynes/cm.
Cyclohexane	25.3 dynes/cm.
n-Hexane	18.4 dynes/cm.
n-Octane	21.8 dynes/cm.

the surface tension of some hydrocarbon liquids. The interfacial tension between water and hydrocarbons will be of the order of magnitude of 30 dynes per centimeter, and will vary according to the nature of the liquids. The surface tension of a pure substance or the interfacial tension between two pure substances is a definite and constant characteristic of the substance or pair of substances.

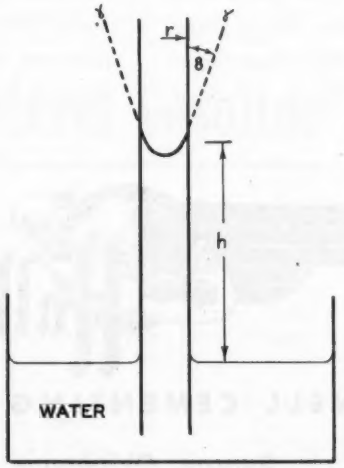

Fig. 1—Rise of water in a glass capillary

One of the simplest manifestations of surface tension is the tendency of free liquid volumes to assume the minimum possible form, as, for example, a sphere in the case of a free drop of liquid, or in the case of one liquid dispersed within another.

Surface tension can be measured in a number of ways. One of most interest is the rise of a liquid in a capillary tube, a matter of common experience. Fig. 1 illustrates the static condition of liquid held in a capillary. The angle θ that the liquid surface makes with the solid surface is called the **contact angle.** Since surface tension acts in the surface of the liquid, it acts at the angle θ to the solid surface.

The total force which holds the liquid up is equal to the force per unit length of surface times the total length of surface, or

$$F_{up} = \gamma \cos \theta \, 2\pi r \qquad (1)$$

where r is the radius of the tube, γ is the surface tension of the liquid, and $2\pi r$ is the circumference of tube. This force is counteracted by the weight of the liquid, which is equivalent to a downward force of mass times acceleration, or

$$F_{down} = \pi r^2 h \rho g \qquad (2)$$

where ρ is the density of the liquid and h is the height to which the liquid is held. When conditions are static, the two forces must be equal. Equating them and solving for γ gives,

$$\gamma = \frac{r h \rho g}{2 \cos \theta} \qquad (3)$$

This expresses the familiar result that a given liquid (γ = constant) will rise higher in a tube of smaller radius. Different investigators have used this equation to measure the radii of capillary tubes, surface tensions, contact angles, and the height of rise of liquids in tubes.

Series prepared by Dr. John C. Calhoun, Jr., Petroleum Engineering School, University of Oklahoma

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NATURAL GAS

Operating Problems to Highlight S. G. A. Meeting

HOUSTON.—Discussions of cathodic protection, use of FM radio in pipe-line operations, employe safety, and other problems of interest to operating and technical personnel are scheduled on the program of the Fortieth Anniversary convention of the Southern Gas Association March 24-26 in Galveston.

The meeting will attract several hundred persons representing the 25 member gas companies as well as equipment manufacturers and distributors. In addition to the operating sessions, sales, home-service, distribution, and accounting sections will meet during the convention.

Among the general session speakers is Dr. Paul Aebersold, chief of the isotopes division of the Atomic Energy Commission, who will talk on "Atomic Energy as a Future Source of Power" at a luncheon Thursday, March 25. At the Friday morning session, Chester L. May, vice president, Lone Star Gas Co., will discuss "LPG—Its Future in Relation to the Natural-Gas Industry."

Panel Scheduled

Of particular interest to the gas-industry operating group is the panel discussion to be held during the transmission section meeting Thursday afternoon. The subject is "Pipe-Line Problems and Practical Solutions." The panel will consist of Landon Yauger, United Gas Pipe Line Co.; O. H. Moore, Tennessee Gas Transmission Co.; Baxter Goodrich, Texas Eastern Transmission Corp.; and H. L. Stowers, Memphis Gas Co.

During this transmission section meeting, talks will be given by Dr. Dan Noble, vice president and director of research, Motorola, Inc., on "Remote Control and Operation of Pipe Lines by FM Radio," and by Carl E. Cloud, Oklahoma Natural Gas Co., who will report on the transmission committee's activities for 1947-48. Cloud is chairman of the transmission section and will preside at the session. Also on the program is a sound film showing the construction of the 30-in. Texas-California gas line which will include a discussion by J. P. Neill, vice president, H. C. Price Construction Co.

The association's operating section, including both distribution and transmission, will meet Thursday afternoon. The program consists of the following: "Cathodic Protection for Natural-Gas Distribution Systems," S. E. Trouard, electrolysis engineer, New Orleans Public Service, Inc.; "Use of Bell Telephone Mobile Service in Connection With the Operation of a Natural-Gas System," W. B. Hardin, Southwestern Bell Telephone Co.; and a panel discussion on "What Is Your Safety Problem?" Chairman of the operating committee is H. K. Griffin, Mississippi Gas Co., Meridian, Miss.

Much of the association's business will be disposed of in the Friday afternoon general session. Officers will be elected and the report of the resolutions committee received. Both the Galvez and the Buccaneer hotels in Galveston will be used for convention meetings.

A.G.A. Group Lays Plans For Meeting in Houston

General session topics scheduled for the annual spring meeting of the natural Gas Department of the American Gas Association at the Rice Hotel, Houston, May 4-5 will include: the tidelands case, progress in conservation, fuels of the future, the Natural Gas Act, research in gas flows in pipe lines, centrifugal compressors, and mobile radio.

Afternoon sessions will be devoted to discussions under the auspices of the transmission, accounting, and production and storage committees.

Natural Gasoline

Sun to Build Gasoline Plant in Starr County

Site clearing has been started by Sun Oil Co. in Starr County, Texas, for a natural-gasoline plant designed to process 25,000,000 cu. ft. of natural gas daily.

The site is less than a mile from the Sun field camp.

James E. Pew, manager of the natural-gas and natural-gasoline division, said specifications for the plant have been forwarded to contractors with requests for bids. The plant is scheduled to be in full operation by April 1, 1949.

Pew said the plant is expected to recover 80 per cent of the propane and subsequently all the butane and natural gasoline from casinghead gas produced in Sun, North Sun, North Rincon, and Garcia fields.

Ten other oil companies operate in the fields which the proposed plant will serve.

Sun last year completed a pressure-maintenance plant in Norwich field, Missaukee County, Mich., and recently completed a plant in Kimball Lake field, Newaygo County, Michigan. The company also is supervising construction of a jointly owned natural-gasoline extraction plant to process gas from Delhi, West Delhi and Big Creek fields in Louisiana.

Sun's program calls for construction of a total of nine plants throughout the country.

C.N.G.A. Fall Meeting Set for October 8

The twenty-third annual fall meeting of the California Natural Gas Association will be held at the Ambassador Hotel, Los Angeles, October 8. The organization will hold its annual June Frolic at the Rio Hondo Golf Club, Downey, Calif., June 5.

Witco to Build Gasoline, Carbon-Black Plants

Witco Hydrocarbon Corp. is preparing to spend $3,500,000 for the construction of two plants in Barhart field, Reagan County, Texas. These will be a 100,000-gal. natural-gasoline plant and a 15,000,000-cu. ft. carbon-black plant. The project will have 30,000,000 cu. ft. daily plant capacity. The company will spend $2,500,000 on the gasoline plant and $1,000,000 on the carbon-black plant. The gasoline plant will produce propane, butane, and natural gasoline.

Both plants will be started about July 1. The Witco firm was incorporated in November 1947. It is headed by Robert I. Wishnick, president, New York, who also operates Witco Chemical Co., Panhandle Carbon Co., Crown Carbon Co., and Continental Carbon Co. This is the first gasoline plant undertaking that Wishnick has been connected with.

The affairs of the Witco company are being handled by Walter F. McDonald, vice president, who established headquarters last week in the Commerce Building, Houston. Witco also has an office at Amarillo. Ray C. Fish, vice president of Witco, is president of Fish Engineering Co., which has contracted the construction of the Witco gasoline plant. Construction of the carbon-black plant has been contracted by Panhandle Carbon Co.

Gas for the plants will come from the properties of Amerada Petroleum Corp., Skelly Oil Co., Danciger Oil & Refining Co., Sharpless Oil Co., and General American Oil Co.

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REFINING

Sinclair Completes Marcus Hook Fluid Cracking Unit

NEW YORK. — Completion of a fluid catalytic cracking unit, capable of converting 25,000 bbl. of heavy oils per day into motor fuels, heating oils, thermal cracking stocks, and gas, at its Marcus Hook, Pa., refinery is announced by Sinclair Refining Co.

Designed to give the highest operating flexibility to meet fluctuating seasonal demands, this unit can produce up to 15,000 bbl. per day of motor gasoline, and 6,000 bbl. per day of heating (furnace) oils.

The cracked gases from the unit will be processed through a U.O.P. nonselective high-pressure catalytic polymerization unit now being expanded at the refinery to convert unsaturates into motor fuel. The residue gas not so converted will be delivered to a local gas utility company for domestic distribution.

Installation of the new cracking unit has made it necessary to add a new boiler house, a new boiler feedwater treating plant, and two new vacuum stills to supply charge stock to the crackers. Also, the company has enlarged the water-supply plant, increased the electrical distribution system, and added five 150,000-bbl. storage tanks on newly acquired land for storing the increased kerosine and heating-oil output.

This cracking unit was designed and built by C. F. Braun & Co. of Alhambra, Calif. A similar unit in Sinclair's East Chicago refinery is already on stream.

Texaco Now Modernizing Lawrenceville Refinery

LAWRENCEVILLE, Ill.—Modernization of this refinery of The Texas Co. is under way, with plans to add a 20,000-bbl. crude and vacuum distillation unit, a fluid catalytic cracking unit of capacity large enough to handle the middle-distillate fractions produced by the entire modernized plant, and a catalytic polymerization unit to convert olefins in the refinery gases to motor fuel.

Also, additional capacity will be added to the gas recovery plant, a new high-pressure boiler installation will be built, new treating capacity will be added, and adequate new storage capacity will be constructed, H. A. McCray, superintendent of the refinery has announced.

Work of clearing site already has begun at the plant. Most of the new units will be erected, it is planned, near the existing cracking units, and the work of designing, purchasing equipment, and letting contracts will require several months.

This refinery, it may be recalled, is the plant where the original development and experimental work was carrier out during the 1920's and early 1930's on solvent dewaxing of lubricating oils employing ketones in combination with other solvent media. The new system plans to process a wide variety of crude oils for making its various products.

Midland Cooperative Lets Cushing Refinery Contract

Refinery Engineering Co., Tulsa, and Chicago, has been awarded contract by Midland Cooperative Wholesale Co. for a $500,000 construction program in Midland's Cushing, Okla., refinery.

The new construction is expected to step up the plant's capacity from 4,200 bbl. of crude daily to 6,500 bbl. and increase its cracking capacity to 2,000 bbl. daily. Construction is to begin this month.

California Standard Will Add Thermal, Unisol Units

A two-coil thermal cracking unit, designed to process 9,000 bbl. daily of heavy oils, and a Unisol unit to extract mercaptans from the cracked gasoline are to be installed in the refinery of Standard Oil Co. of California at Bakersfield, Calif. Universal Oil Products Co. will design the units.

Manpower Needs In Refining to Increase

Employment in the refining industry, which reached an all-time high in 1947, is expected to increase gradually for several years, according to a forecast of the United States Employment Service.

Employment in January at 131 establishments representing "virtually the entire industry," totaled 173,250. In December, the report points out, voluntary separations were only 0.5 per cent of employment, the lowest rate in any reporting manufacturing industry.

"As to long-range prospects, employment should continue gradually

upward for a number of years. As new production facilities are put in operation, more significant manpower needs may be felt than at present. Such expansions will probably be concentrated in the eastern part of the United States," the report states.

"Because of its characteristically low turnover," it adds, "replacement needs for the industry are estimated at 1,000 a month."

Four Texaco Projects To Cost $118,000,000

Four major projects of The Texas Co., involving the expenditure of approximately $118,000,000, are scheduled for completion later this year or in 1949, according to the company's annual report.

Completion of the Eagle Point refinery on the Delaware River near Camden, N. J., is scheduled for mid-1949. The refinery will have an initial crude capacity of 40,000 bbl. Construction was started in 1947.

At Port Arthur, Tex., construction is scheduled to be completed this year on new lubricating-oil equipment, including a vacuum pipe still unit, an additional furfural refining unit, and an additional solvent dewaxing plant.

Planned for completion in 1949 are plant additions at the company's West Tulsa, Okla., and Lawrenceville, Ill., refineries. Plans include crude units, fluid catalytic cracking units, and auxiliaries.

Important additions to the company's Beacon, N. Y., research laboratories are expected to be in operation by the end of this year.

Socony-Vacuum Making New, Odorless Solvent

NEW YORK.—A new, almost odorless solvent for dry-cleaning textile products has been announced by Socony-Vacuum Oil Co., Inc. It is designated to the trade as "PD942A" and is said to eliminate practically the time required for deodorization of fabrics after cleaning with it.

This product is claimed to be decidedly advantageous for use in paints for hospitals, hotels and stores, which can be opened to the public almost as soon as the paint dries, due to the absence of solvent odors.

Deal for Crude Completed

National Cooperative Refinery Association has completed an arrangement with Leland Fikes, Dallas, whereby the cooperative will receive between 8,000 and 9,000 bbl. of crude per month from Kansas leases owned by Fikes. The crude will come from leases in Reno, Rice, Barton, and Russell counties. The cooperative operates an 18,000-bbl. refinery at McPherson, Kans.

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PIPE LINES

Salt Lake Pipe Line Construction to Begin

Tentative plans for the construction of the 10-in. Rangely field-Salt Lake City pipe line have been set for June this year in order to have the line in operation by the end of the year. Cost has been estimated at $5,500,000.

The line, which will be built by Salt Lake Pipe Line Co., a wholly owned subsidiary of Standard Oil Co. of California, will traverse Wolf Creek pass, northwest of Duchesne, Utah, at an elevation of 9,480 ft.

The new line will supply the $5,000,000 refinery now being planned by California Standard at North Salt Lake City. Initial capacity of the refinery will be 15,000 bbl. of crude oil daily. The pipe line's initial capacity is to be 25,000 bbl. daily with a possible increase to 35,000 bbl. daily. Both refinery and pipe-line facilities are hoped to be completed by the end of the year.

The 10-in. line will pass near Bonanza, Utah, where large gilsonite deposits are located. Company officials pointed out that if experiments now being conducted to determine possibility of commercial production of oil from gilsonite are successful, the line would be available to transport such oil.

President of the new pipe-line company is T. S. Peterson, who is also president of Standard Oil Co. of California. C. F. Hensen is vice president and R. W. Johnson is secretary-treasurer. Offices of the company are in the Utah Oil Building in Salt Lake City.

Pan American Begins 16-In. Line Construction

HOUSTON.—Construction has been started by Pan American Gas Co. on a new 16-in. gas pipe line from Chocolate Bayou field in Brazoria County, Texas, to Texas City.

The new 20-mile line parallels the company's existing 8-in. gas line and is being built to meet increased demands for fuel gas in the Texas City industrial area. The line will have a capacity of more than 150,000,000 cu. ft. daily. Pan American Refining Corp. operates a refinery with a capacity of about 100,000 bbl. daily in Texas City.

In the construction of the line, special precautions are being taken to combat corrosion, according to E. R. Turner, Pan American Gas Co. president. The pipe is being wrapped with a coal-tar saturated felt paper over a fiberglas wrap which has been saturated in coal tar. The line is being constructed of 45-lb. seamless steel pipe with a rated operating pressure of 1,000 psi.

Latex Construction Co., Houston, has the contract.

Pan American Gas Co. is now completing a modern gas-metering and regulating terminal at Texas City. The terminal is fully automatic in its operation, with all measurements, receipts, and deliveries of gas being automatically handled from a central control room.

Fish Engineering Corp., Houston, is the contractor on the terminal construction.

Pennsylvania Oil Firms Gain Pipe Line Stock

As a result of recent stock purchases approximately one-half of all outstanding shares of Southwest Pennsylvania Pipe Lines, Oil City, Pa., is now owned by four Pennsylvania oil firms. Those firms are Pennzoil Co., Oil City, Pa.; South Penn Oil Co., Bradford; Waverly Oil Works, Pittsburgh; and Washington Oil Co., Washington, Pa.

When the four companies announced that they would purchase additional shares of Southwest last month, they stated that they were doing this to "protect" their refining and producing interests and not for investment purposes. Southwest is a former Standard Oil Co. (N.J.) subsidiary.

Waverly and Pennzoil are two of the principal refiners of oil of the kind gathered by Southwest. South Penn is the largest producer of crude for the pipe-line company and Washington Oil Co. is the second largest.

Independent Natural Builds Line in Sweeney, Tex., Area

Construction is more than a third completed on the 25-mile line of 8-in., 6-in., and 4-in. in the Sweeney, Tex., area being laid for Independent Natural Gas Co. by Associated Contractors & Engineers.

A 22-mile, 12-in. line near Soso,

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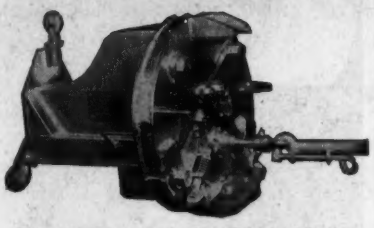

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Miss., was started last week for United Gas Pipe Line Co. by Associated.

This contracting firm will commence construction soon on 27 miles of 8-in. in the Dallas-Fort Worth area for Texas Pipe Line Co. This will be a continuation of the 172-mile, 10-in. products line from Hearne to the Dallas area, started early in October; welding for this was completed January 5. Subsequently doping operations have been catching up with welding. Last week doping had proceeded to within 8 miles of Dallas.

Philadelphia Gas Works Will Get Additional Gas

The Federal Power Commission has ordered Texas Eastern Transmission Corp. to deliver 4,300,000 cu. ft. of natural gas daily to Philadelphia Gas Works Co., beginning March 25 and continuing through April 30, 1948, provided that such deliveries may be reduced or discontinued on short notice to meet any emergency in the areas now served by Texas Eastern.

Philadelphia Gas Works previously had been denied a request for emergency allocation because of a more critical gas shortage existing in northern Pennsylvania and western New York which was served by United Natural Gas Co., the order stated. The emergency allocation of 10,500,000 cu. ft. daily to United has been ordered continued through April 7, 1948, to enable that company to meet its gas requirements through March.

Humble Replaces Line in Pettis-Refugio Area

Humble Pipe Line Co. is laying 9 miles of 8-in. to replace an equal amount of 6-in. between Pettis and Refugio, Tex. This has been contracted by Massey Construction Co.

Latex Construction Co. has contracted with Humble for laying 7 miles of 8-in. between Hastings and Webster, Tex.

Five Spreads Working On Sinclair System

Sinclair Refining Co. has five spreads working on the 455 miles of products lines extending north from Houston via Bryan and Arlington, Tex., into Oklahoma to connect with an existing 8-in. crude-oil line to Wood River, Ill., which will be converted to products service.

Operations are under the direction of W. W. Baker, vice president in charge of products pipe lines. This project is being supervised from offices established in the First National Bank Building, Bryan, Tex.

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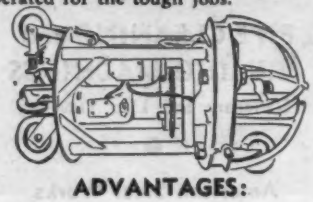

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10-in. has been laid by H. C. Price Co., contractor of the 270-mile, 10-in. Houston-Bryan-Arlington section of the system. Approximately 18 miles had been laid up to last week near Arlington for the 185-mile, 8-in. section, extending north from Arlington, which has been contracted by Pacific Pipe Line & Engineers, Ltd.

H. C. Price Co. has three spreads working under the supervision of Charles Le Noir. The southernmost spread is near Tomball, Tex. A Price spread working east of Calvert, Tex., has headquarters at Marlin. The price warehouse at Arlington serves a spread working northeast of Mansfield, Tex.

V. L. Williams, superintendent, Pacific Pipe Line & Engineers, Ltd., operates from a field office at Ardmore and a warehouse at Tecumseh, Okla. Work has been going on in the Tecumseh - Wanette area near Little River. A short crew is scheduled to work in the Arbuckle Mountains. The Pacific spread working 4 miles north of Arlington, Tex., has warehouse and office at Denton, Tex.

The Pacific organization brought equipment to the Sinclair project from West Virginia after completing a 55-mile, 10-in. natural-gas line (started in June 1947) under contract with Carbide & Carbon Chemicals Corp., subsidiary of Union Carbide Co. The line transmits gas northward to the Carbide & Carbon chemical plant at Charleston, W. Va.

FPC Suspends Sales of Panhandle to East Ohio

The Federal Power Commission has suspended, pending hearing, an agreement filed by Panhandle Eastern Pipe Line Co. covering sales of natural gas to East Ohio Gas Co. FPC stated that the rates and charges proposed for Panhandle's additional deliveries are substantially in excess of those now received by Panhandle for gas being sold to East Ohio and that such increases in rates have not been shown to be justified.

Under the proposed agreement Panhandle would have obligated itself to deliver to East Ohio an additional 12,500,000 cu. ft. of natural gas daily when Panhandle's "Group B" facilities are completed and up to 25,000,000 cu. ft. daily when its "Group C" facilities are completed. The rate for such deliveries would have been 25.9 cents per 1,000 cu. ft. until October 1, 1950. It is estimated that the proposed rates could result in an increase of charges of approximately $675,000 per year over Panhandle's present charges to East Ohio, the report stated.

FPC also pointed out that the sale of gas to East Ohio under the proposed agreement may constitute an undue advantage to it over other gas companies in the same area buying gas from Panhandle.

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Among the Drilling Contractors

Active Rotaries to Lowest Figure in Nine Months

Active rotary rigs in the U. S., influenced no doubt by the severe winter, dropped to the lowest figure in 9 months during February with only 1,895 rigs running.

In these latest figures released by the Interstate Oil Compact Commission, the Gulf Coast and Illinois areas registered the largest losses with 42 and 34 fewer rotaries active. Despite the cold weather, Kansas and the Rocky Mountain and West Texas-New Mexico areas showed slight gains.

Rigs by areas for February as compared with the previous month are as follows:

	Jan.	Feb.
Pacific Coast	164	157
Oklahoma	260	249
Kansas	105	110
Rocky Mountains (including western Canada)	161	168
N. La., E. Tex., and Ark.	149	135
W. Tex. and N. Mexico	524	532
Gulf Coast	530	488
Illinois	90	56
Total	1,983	1,895

Drilexco Hits in Turkey

Drilling & Exploration Co., Inc., Los Angeles, has brought in a 300 to 400-bbl. daily well for Government Oil Co. of Turkey on the Ramandag structure in the southeastern part of the country. Well was completed with total depth of 4,390 ft. and swabbed 15°-gravity asphalt-base oil.

Regent Drilling Co., Ltd., Edmonton, Alta., is starting a 7,000-ft. test for Canadian Gulf Oil Co. in LSD 2, 11-37-23w4.

San Joaquin Drilling Co., Los Angeles, is drilling Mountain Fuel Supply Co. 4 Unit, Church Buttes field, Uinta County, Wyoming.

White-Webb Drilling Co., Dallas, has contracted to drill 5,000-ft. test in Norman Paul field, Wood County, Texas, the Stroube & Stroube 2 D. A. Sparham.

J. D. Ferrell Drilling Co., Great Bend, Kans., has purchased the drilling equipment and properties of Biddle Drilling Co. whose president, Irvin Biddle, died last January. Lloyd Pickrell has taken over operation of producing properties of the Biddle concern.

Frost & Wilde, Muenster, Tex., will drill 2,500-ft. rotary wildcat in northwestern Cooke County, North Texas, for Henry Wittmer and C. R. Craig, of Fort Worth. Location has been staked for 1 W. A. Erwin, J. R. Armendaris Survey, A-1,234, 6½ miles northeast of Muenster field.

Harper-Turner Drilling Co., Oklahoma City, has been incorporated with $100,000 capitalization by Gov. Roy J. Turner and F. E. Harper. Firm was organized to operate drilling rigs owned by the two men who are also partners in Harper-Turner Oil Co.

Shaw Petroleums, Lloydminster, Sask., is starting the first well for Lognora Gild Mines-Hargal Oils and Royal Canadian groups in Lloydminster field. A 50-well program is being arranged.

California chapter of the American Association of Oilwell Drilling Contractors has opened an office in the Halliburton Building in Los Angeles. W. Frank Jones has been named secretary of the chapter.

George P. Livermore, Inc., Lubbock, Tex., has contract for Honolulu Oil Corp. 1 Ellwood Estate, proposed 7,500-ft. wildcat in east-central Hockley County, West Texas. Application for test gave location as Section 13, Block A, R. M. Thompson Survey, 3½ miles north of Snyder. Contract depth is expected to explore lower Permian.

Arrow Drilling Co., Tulsa, and Sells Petroleum Co. have completed arrangements with Phillips Petroleum Co. for drilling three wells on farmout acreage in the Harrison County, East Texas, side of Longwood field of Caddo Parish, North Louisiana. Location has been made for Phillips 1 Mattie Boynton, in the McMillan Survey, as an east offset to Sells and Arrow's Travis Peak discovery. The second test is Phillips 1 Rudd, William Grouch Survey, ½ mile south of the 1 Boynton. Third test is the 1 T. J. Taylor, Thomas Anderson Survey, and 1 mile southeast of the Arrow-Sells discovery.

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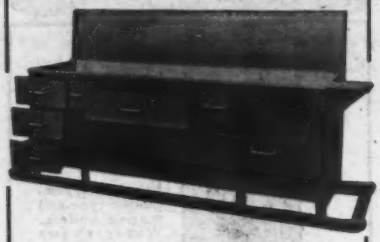

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Growth. — Kerr-McGee Oil Industries, Inc., had its beginning in 1926 when Robert S. Kerr and James L. Anderson, brothers-in-law, joined the drilling firm of Gibson Brothers Co., Ada, Okla. In 1928, Kerr and Anderson bought all interest in the company and organized Anderson-Kerr Drilling Co. with equipment consisting of two steam rigs operating in Seminole field. After production was acquired in Oklahoma City field, A & K Petroleum Corp. was formed in 1933.

Anderson sold his interest in 1936 and the two firm names were changed to Kerlyn Oil Co. and Kerr-Lynn & Co. Partners in Kerr-Lynn & Co. (which owned 95 per cent of Kerlyn Oil Co.) included Kerr, Robert Lynn, Dean A. McGee, T. M. Kerr, T. W. Fentem, and Dean Terrill. In August 1942, Kerr-Lynn & Co. assets were sold to Kerlyn Oil Co. and Lynn sold out. In January 1946 the present name of Kerr-McGee Oil Industries, Inc., was adopted. Kerr-McGee has built up oil and gas production to a monthly volume of $250,000.

Rigs.—Thirty-one rigs, including 2 steam and 29 power rigs, ranging from shallow-depth to the heaviest equipment.

Personnel.—Robert S. Kerr, president; Dean A. McGee, executive vice president; Dean Terrill, vice president and general counsel; T. W. Fentem, secretary-treasurer; T. M. Kerr, vice president in charge of drilling; T. W. Wheeler, manager of drilling department; T. L. Glover, Mid-Continent superintendent; Wayne Dean, Rocky Mountain superintendent; W. F. Baxter, Gulf Coast superintendent; Otis Danielson, chief drilling engineer; B. B. Kerr, contract man; and Sam King, safety engineer.

Sidelights. — Kerr-McGee has a number of discoveries to its credit, either under contract or for its own account, including: Magnolia field, Arkansas (1938); Sheldon Dome, Fremont County, Wyoming (1945); West Asher (1930), and South Maud (1941) in Oklahoma; Pettit pay, Spider area, Louisiana; Block 32, in the Gulf of Mexico, offshore from Terrebonne Parish, Louisiana (1947); West Edmond, Oklahoma, (1943); and 12 pools in North Texas. . . . Company is currently drilling Stanolind Oil & Gas Co. 1 Briscoe Unit, Grady County, Oklahoma, potentially world's deepest producing well. . . . 700 persons are employed. . . . Converted army C-47 is used for air transport. . . . —Refinery with 6,000 bbl. daily capacity is owned and operated at Wynnewood, Okla.

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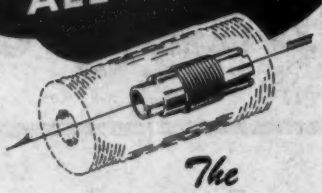

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Exploration and Drilling

Trends in Geophysics

THE major postwar trends in the field of geophysics ought to be visible by this time, or at least this would seem a reasonable assumption by normal standards. Perhaps they are, but if so, it is in the sense that things are happening, or about to happen (according to fairly reliable reports), in so many different directions, along so many different lines of attack, that the situation is confusing. There are indications that many geophysicists, as well as ordinary oil men, are curious about just where the general trend is heading.

That means a large attendance is assured at the annual meeting in Denver next month. They will be there for two purposes; and the formal program will serve only one of these. There are going to be many important papers and discussions on the formal program. About some of these there will be either differences of opinion about the author's conclusions, or about the significance these conclusions may have for the future, even if they are correct. The special session aimed at the hard-rock mining industry may be the entering wedge that will open up a substantial new area of economic opportunities. From these and other items on the formal program, those attending will extract a lot of information of interest to them, and draw their own conclusions about things.

But the importance of the second purpose will be gaged by the conversations that go on in the informal groups in the lobbies, the halls, private rooms, everywhere that two or more geophysicists get together. In these informal gatherings there will be considerable swabbing, and much of swapping of information. Everybody knows there are many new ideas and new instruments being worked on, which have not yet reached the stage of being ready for public announcement. A lot of people have ideas about the conventional methods and instruments in use; ideas for improved instrumentation; ideas for improved interpretation. Scraps of information, and sometimes a lot more than scraps, about these will be present in Denver from all over the United States, and from some foreign countries. Gathering as many as possible of these, and piecing them together will form the second objective.

There will be several papers on the airborne magnetometer this year, as there were at the last meeting. But this time there is a difference. Now practical results and operational problems of jobs actually performed give a new starting point. It is interesting to note that there are papers scheduled on the theory and interpretation of magnetics. Obviously if the airborne magnetometer is here to stay, the field of interpretation becomes important. This has been the pattern of successful instruments in the past.

Surveying problems are still with the geophysicists, important, though irksome. It is typical of the character of these aggressive scientists that although they are revolutionizing surveying, they take no pride in it as an achievement, but regard it as a nuisance to be eliminated in order to get on with problems of more interest and importance.

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

ROCKY MOUNTAIN.—Pure Oil Co. has established a new depth record for the Rockies area at West Poison Spider, Natrona County, Wyoming, with the 1 Unit, 11-33n-84w, and is currently drilling below 13,500 ft. Seaboard Oil Co.'s probable new discovery at Silver Tip, 5 miles west of Elk Basin field, Wyoming, encountered mechanical difficulties and has not been tested. Phillips Petroleum and Kerr-McGee 1 Arapahoe, deep test of the Sheldon Dome in Wyoming, found some saturation in the Amsden and Madison formations, but may be plugged back for a new pay for the field in the Tensleep.

NORTH CENTRAL TEXAS.—Latest reports confirm the discovery of the first commercial production for the Pan American Production Co. in the area, at their 1 Clark, 3 miles northwest of Stamford in Haskell County, which was completed for 44 bbl. of 36.6°-gravity oil from the King sand (Pennsylvanian) at 2,350-59 ft. A northeast extension to KMA production in Goldsmith field, near the Wichita-Archer county line, appears to be a large producer and is expected to open considerable acreage for further drilling.

CALIFORNIA.—Discovery of a new zone above previously known producing horizons in the Rincon-Padre Canyon-San Miguelito area was found in Chanslor-Canfield Midway Oil Co.'s recompletion, the B-47 Hobson, 16-3n-24w. Due to the complex faulting of the district, it has not been determined whether the well is the most southeasterly location in the Rincon field or whether it is producing from the main Padre Canyon field structure.

SOUTH LOUISIANA.—Sohio Petroleum and General Crude Oil Co. B-1 Sweet Lake Land & Oil Co., 30-10s-6w, opens a new gas pool in Calcasieu Parish, 2 miles east of oil production in Holmwood field.

CANADA.—Unusual circulation problems and other difficulties were overcome for the successful completion of the Atlantic Oils 3, LSD 12, 23-50-26w4, a large producer in the northeastern sector of Leduc field.

EAST TEXAS.—A rank wildcat on E. G. Moorehead property, near the Marion-Harrison county line about 9 miles southeast of Jefferson, is being considered. The venture will go to 10,000 ft. to test the Travis Peak.

SOUTHWEST TEXAS.—A new pool has been discovered by Baldridge & King et al 2 East, about 6½ miles south of Armstrong field, and 16 miles southwest of Hebbronville, Jim Hogg County, which was completed for 58 bbl. of oil per day.

EASTERN TEXAS

Jones Planning Travis Peak 10,000-Ft. Test

DALLAS.—A 10,000-ft. Travis Peak exploratory test near the Marion-Harrison County line, 9 miles southeast of Jefferson, was reported under consideration by J. Edward Jones, New York City. The proposed wildcat, which is to get under way early this summer, is to be drilled on a block of 10,000 acres assembled by E. G. Moorehead, of Shreveport, it was said. Humble Oil & Refining Co. is reported supporting the venture.

Another Travis Peak well to be drilled is G. J. Hollandsworth, Longview, Tex., independent operator, 1 Mrs. Alice Grain, in the J. B. Sweeten Survey, 5 miles northeast of Beckville, in Panola County. Planned depth is 7,000 ft.

In Henderson County, W. B. Hinton, first reported as E. L. Howard et al, 1 J. M. Criswell estate, C. M. Walters Survey, was moving in rotary tools. Work was delayed by a storm that washed away board roads and damaged the derrick, which was about half completed at the time. It is a Travis Peak test, but contract depth was not announced.

In Shelby County, Humble Oil & Refining Co. 1-C Pickering Lumber Co., 2 miles east of Patroon, was drilling below 6,782 ft. in shale and limestone. It had base of the Massive anhydrite at 6,040-50 ft., by samples. This well had previously reported some oil on a drill-stem test of the upper Glen Rose, which has attracted interest to the area around Patroon. Companies said to be seeking leases include Skelly Oil Co., H. L. Hunt, and Southern Production Co.

In Kaufman County, Shell Oil Co., Inc., 1 Lumpkin, 4 miles southwest of Cedarville, had apparently exhausted the possibility of oil in the Smackover, and was shut down for orders. It was said to have shown some oil shows in the Rodessa and upper Paluxy and operators may set pipe for tests higher in the hole. On last report, the well was drilled to total depth of 10,800 ft., plugged back to 10,421 ft., and drilled out to 10,850 ft. A drill-stem test between 10,475-550 ft., open 45 minutes, recovered 3,000 ft. of water cushion and 5½ bbl. of muddy salt water, with no shows.

In the Longwood extension area of Harrison County, Phillips Petroleum Co. 1 Rudd, McMillan Survey, reported a flow of 99.7 bbl. of oil in 23 hours, flowing through ¼-in. choke, and cutting 2 per cent sediment and water. Gas-oil ratio was 500 cu. ft. Casing is perforated at 5,625-46 ft., in the Pettit. While the first Pettit completion in this area was a gas-distillate well, the 1 Rudd is producing oil. Specific gravity was not available.

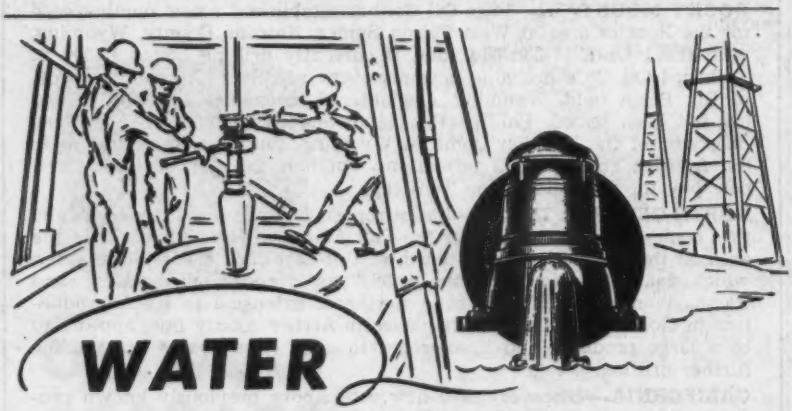
In the Blackfoot field, Anderson County, The Texas Co. 1 J. B. Barnard had little signs of becoming an oil well. With total depth at 9,900 ft., operators acidized with 2,500 gal. in open hole between 9,800-9,900 ft., swabbed down to 8,500 ft. and recovered a small amount of gas with a very small show of oil. It was left standing overnight and the fluid rose to 7,100 ft. Operators were to reacidize.

W. F. Nenney 1 Ione Braziel et al, Paluxy exploration in Smith County, Thomas Rives Survey, was drilling below 4,365 ft. Sample top on the Austin chalk was 4,320-35 ft.

EAST TEXAS (DISTRICTS 5 & 6) WILDCAT FAILURES

Cass County: Shell Oil Co., Inc., 1 Gerald Smith, R. Peters Sur., 2 mi. W Bloomburg, dry, TD 10,825 ft., logged Buckner 10,300 ft., Smackover 10,682 ft., elev. 339 ft., sample tops: Woodbine 3,540 ft., Red Beds 3,586 ft., Goodland 3,870 ft., Paluxy 4,030 ft., Massive anhydrite 5,895 ft., Pettit 6,910 ft., Travis Peak 7,047 ft., Cotton Valley 7,902 ft.

Houston County: Continental Oil Co. 1 B. E. Wooters, John I. Ellis Sur., 3 mi. N Lovelady, dry, TD 8,240 ft., no shows, sample tops: Wilcox 1,570 ft., Pecan 6,931 ft., Wodbine 8,110 ft.



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WELL WATER SYSTEMS

SOUTH LOUISIANA

Sohio Opening New Bell City Gas Pool

NEW ORLEANS.—In the Bell City area, Calcasieu Parish, a new gas pool is being opened by Sohio Petroleum Co. and General Crude Oil Co. B-1 Sweet Lake Land & Oil Co., 30-10s-6w, approximately 2 miles east of oil production in Holmwood field. Perforations are at 10,736-750 ft. where it flowed dry gas and has a shut-in pressure of 3,850 psi. Dry gas also was tested in this well through perforations at 10,350-362 ft., and operators tried for several weeks to get oil production from the 10,100-ft. level. Tests were conducted through a series of perforations between 10,018-030 ft. where it showed a small amount of 38°-gravity oil, but operators were unable to shut off water. Total depth is 10,843 ft.

The Texas Co. 1 Luke Guidrez, wildcat test, 51-17s-20e, in Lafourche Parish, southeast of Valentine dome, encountered sand showing gas from 11,070-100 ft. Operators cemented 7-in. pipe to 11,621 ft. for protection. Now drilling in shale below 12,414 ft. Atlantic Refining Co. 1 H. Dommert, 29-9s-2w, has been completed to extend Egan field, Acadia Parish, ¾ mile west. Drilled to a total depth of 10,796 ft., this well flowed a potential of 35 bbl. of 60°-gravity water-white condensate and 1,575,000 cu. ft. of gas per day through a 10/64-in. choke with gas-condensate ratio of 45,200. Flowing pressure on the tubing was 3,500 psi. Well has been shut in waiting on pipe-line connections. Perforations for completion are in the Hayes sand at 10,664-10,684 ft.

At Grand Bay, in Plaquemines Parish, Gulf Refining Co. 31 Louisiana State "QQ" flowed on final gage 280 bbl. of 35.2°-gravity oil per day through a 10/64-in. choke with 1,375 psi. flowing pressure on the tubing and gas ratio of 580. Production is through perforations at 8,420-36 ft.

At Golden Meadow field, Lafourche Parish, Sparton Drilling Co. completed 4 B. & D. Unit, 12-19s-22e, for a potential of 450 bbl. of 36.7°-gravity oil through a 9/64-in. choke. Total depth is 12,150 ft., with perforations for completion at 11,803-807 ft.

The 18 new locations reported this week included 5 wildcat starts, 2 in Terrebonne and 1 each in Calcasieu, Cameron and St. Landry parishes. The 15 completions included 8 successful oil wells and 7 dry holes. One successful exploratory well extended Egan field production while two wildcats were dry, one each in Iberia and Orleans parishes.

SOUTH LOUISIANA SUCCESSFUL WILDCAT

Acadia Parish: Egan west extension—Atlantic Refg. Co. 1 H. Dommert, 29-9s-2w, ¾ mi. W of production, TD 10,796 ft., top sand 10,664 ft., Hayes sand, perf. 10,664-684 ft., IP: 35 bbl. condensate per day through a 10/64-in. choke, GCR 45,200, TP 3,500 psi., gravity 60°, no water.

SOUTH LOUISIANA WILDCAT FAILURES

Iberia Parish: H. L. Hunt 1 George Viator, 56-12s-6e, 1 mi. S of shore line of Spanish Lake and 8 mi. NE of Jefferson Island field, dry, TD 11,974 ft.

Orleans Parish: Sid W. Richardson 1 Samuel Zemmurray, Gentilly area, 6-12s-13e, 3 mi. S of Little Woods townsite and 1½ mi. NE of Lee townsite, dry, TD 10,037 ft.

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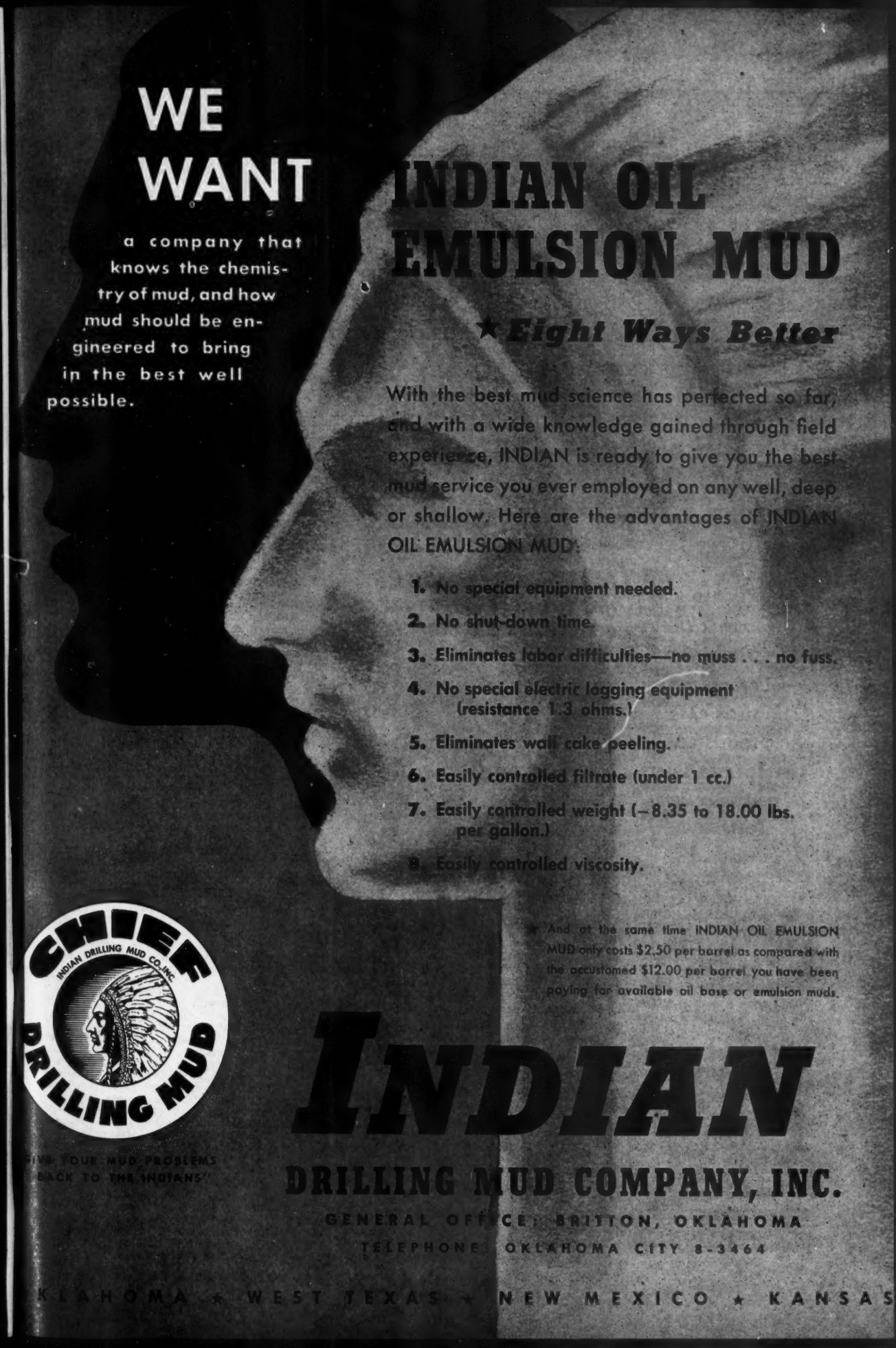
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MICHIGAN

One New Producer Is Completed in Michigan

SAGINAW.—Wildcatting, generally unsuccessful, makes up the bulk of new operations in Michigan. Completions were down to nine last week, six of those being wildcats completed as dry holes, except for a small gas well in Missaukee County. The only new oil producer was a 35-bbl. completion in Mt. Forest Township, Bay County. The wildcat gas well, rating 525,000 cu. ft. initially, dwindled rapidly. Originally an oil exploration, it was drilled to 3,859 ft., plugged back to 1,439 ft. Three of the wildcat failures were in Allegan County, the others in Muskegon and Newaygo.

Only six new locations were announced, four of those being wildcats, two in Gratiot County, one in Lapeer, one in Montcalm. The others are in Allegan and Arenac counties.

MICHIGAN SUCCESSFUL WILDCAT

Missaukee County, Clam Union Township: Gulf Refining Co. 1 Anna L. Alderman, SW NW NE 2-21n-6w, gas well, 525,000 cu. ft., TD 3,859 ft., plugged back to 1,439 ft.

MICHIGAN WILDCAT FAILURES

Allegan County, Allegan Township: Ohio Oil Co. 1 David C. Gile, NE NE NE 30-2n-13w, dry in Traverse limestone, TD 1,366 ft.

Monterey Township: Mart Johnson 1 Millie Alrich, SE SE SW 6-3n-13w, dry in Traverse limestone, TD 1,626 ft.

Salem Township: R. K. Degenther 1 Gerard and Louise Funk, SW SW NE 13-4n-13w, dry in Traverse limestone, TD 1,735 ft.

Muskegon County, Montague Township: Eugene Hillard 1 George Underwood, SE NW SE 10-12n-17w, dry in Traverse limestone, TD 1,764 ft.

Newaygo County, Croton Township: Granville C. Berlin 1 Harris and Johanna Mahr, NE SW NE 34-12n-18w, dry in Detroit River, TD 3,230 ft.

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TEXAS GULF COAST

Bonnie View Extension Well Flows 100 Bbl.

HOUSTON.—Anderson & Kirkwood 1 Frank Jones, northeast extension well at Bonnie View field, in Refugio County, is reported to have flowed an estimated 100 bbl. of oil per day through a ¼-in. choke, with 350 psi. tubing and 1,400 psi. casing pressure, on initial test. Operators are now waiting on potential gage. Total depth is 4,592 ft., with 5½-in. casing at 4,550 ft. On drill-stem test at 4,213-17 ft., in a new pay zone in this well had recovered 1,000 ft. of pipe-line oil in 9½ minutes, prior to setting casing.

A new oil producing pay for Sabine Tram field, Newton County, has been completed at Rock Hill Oil Co. et al 1 Johanna Vogt, in the Rafael Manchola Grant. Drilled to a total depth of 5,025 ft., this well flowed 91 bbl. of oil per day through a ⅛-in. choke, gas-oil ratio 2,860 with tubing pressure 730 psi., casing 1,280 psi. Production is through perforations at 4,342-45 ft., with top of pay at 4,334 ft.

Brown & Wheeler D-1-W J. R. Kauffman, in P. Trevino Grant, opened a new gas pay for Hord's Creek pool in Goliad County. On potential gage this well flowed 40,000,000 cu. ft. gas per day on open flow, gas-condensate ratio 250,000, with shut-in pressure 2,950 psi. Production is through perforations at 8,395-98 ft., Massive sand. Total depth is 8,620 ft.

Falcon Seaboard & Dunwoody 2 Sun Bashara is a new deep producer on the north flank of the Saratoga dome in Hardin County. Total depth is 7,814 ft., with perforations at 7,198-7,318 ft. for completion. On potential gage the well flowed 127 bbl. of 35°-gravity oil per day through a 10/64-in. choke .

A new Brazoria County oil field is being opened in the Bailey's Prairie area at Pan-American Production Co. 1 Munson, in H&TC Survey, Section 1. Total depth is 11,956 ft., and well is flowing approximately 45 bbl. of 38°-gravity oil along with an equal amount of water through a 6/64-in. choke through perforations at 10,854-880 ft. Tubing pressure 3,550 psi. The well is being completed through the drill pipe, which was stuck and later cemented in the hole. Separators and tanks are being erected for final completion.

The 39 new locations reported this week for Districts 2 and 3 included 25 wildcat starts, 2 each in Wilson and Live Oak, and 1 each in Bee, Calhoun, Colorado, Fort Bend, Goliad, Harris, Karnes, Lavaca, Lee, Liberty, and Matagorda counties. Three successful exploratory wells were completed, opening new pay zones one each in Hord's Creek, Goliad County; Sabine Tram field, Newton County; and West Pridham Lake in Victoria County. Thirteen wildcats were dry, three in Fayette, two each in Brazoria, Chambers and Lee, and 1 each in Bee, Calhoun, Jackson and San Jacinto counties.

TEXAS GULF COAST (DISTRICTS 2 & 3) SUCCESSFUL WILDCATS

Goliad County: New gas pay Hord's Creek—Brown & Wheeler D-1-W J. R. Kauffmann, in P. Trevino Grant, top Mackhank sand 8,170 ft., top pay 8,395 ft., Massive sand, TD 8,620 ft., perf. 8,395-

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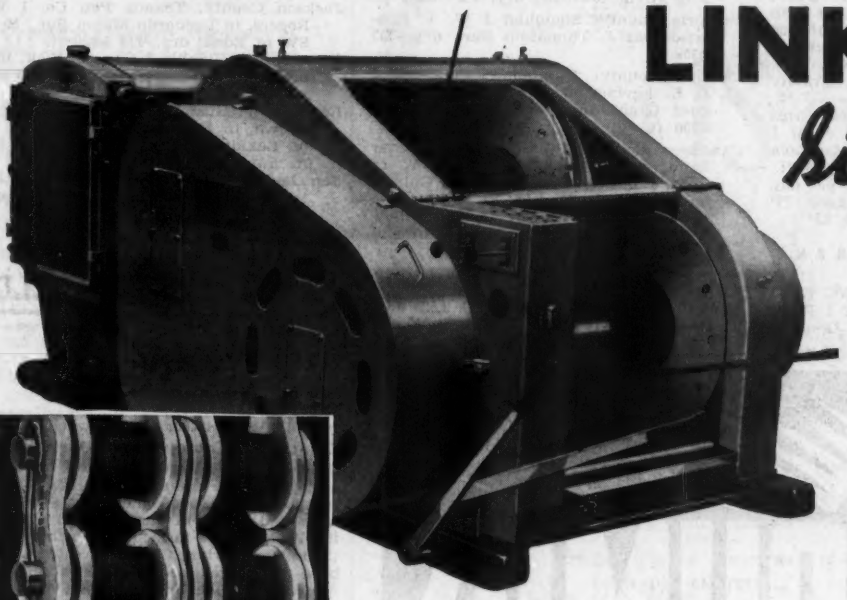

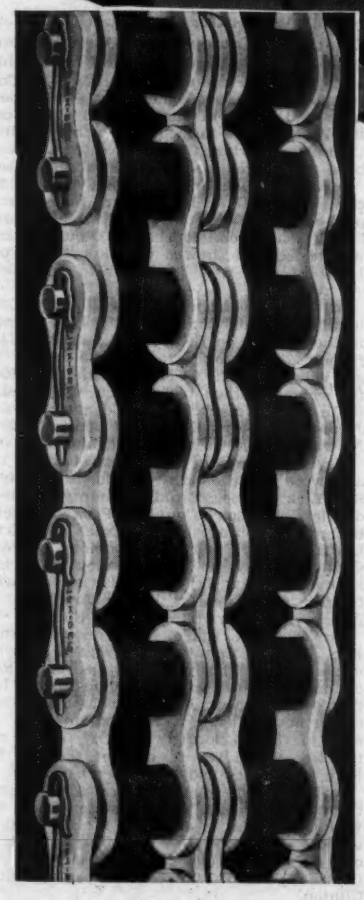

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98 ft., IP: 40,000,000 cu. ft. gas per day on open flow, gas-condensate ratio 250,000, shut-in pressure 2,950 psi.

Newton County: New oil sand Sabine Tram field—Gulf Oil Corp. 1-C J. P. Bevil, Sr., et al, in R. I. Richardson Sur., top sand 7,366 ft., perf. 7,366-70 ft., IP: 60 bbl. per day and 58 bbl. salt water per day through a ¼-in. choke, GOR 7,040, TP 1,773 psi., CP 2,250 psi., gravity 43.1°, TD 8,027 ft.

Victoria County: New oil pay West Pridham Lake—Rock Hill Oil Co. et al 1 Johanna Vogt, in Rafael Manchola Grant, top pay 4,334 ft., TD 5,025 ft., perf. 4,342-45 ft., IP: 91 bbl. oil per day through a ⅛-in. choke, GOR 2,860, TP 730 psi., CP 1,280 psi., gravity 25°.

TEXAS GULF COAST (DISTRICTS 2 & 3) WILDCAT FAILURES

Bee County: Alaska Steamship Co., Newman Bros. & J. E. Mowinckle 1 F. A. Hilleschein Est., in Sec. 100, Geo. H. Paul's Subd. of J. J. Welder Ranch, 3 mi. E of Tynan, dry, TD 5,499 ft.

Brazoria County: H. L. Hunt 1 Alvin Ind. Sch. Dist., in M. O'Connell Sur., 1¼ mi. S of Alvin townsite, dry, TD 10,871 ft.

Brazoria County: Stanolind 1 W. T. Robertson, in J. Thopmson Sur., dry, TD 9,369 ft.

Calhoun County: Quintana Pet. Corp. 1 J. E. Levingston, in Bonifacio Rodriguez Grant, in Sheriff area, dry, TD 9,250 ft.

Chambers County: Humble 9 State-Cedar Point, in Section 120, 1½ mi. W of Cedar Point field production, in Galveston Bay, dry, TD 8,824 ft.

Sun Oil Co. 1 E. W. Boyt & J. M. Rich, in H&TC Sur., in Double Gum discovery area, dry, TD 9,068 ft.

Fayette County: K. Hughes 1 John J. Ryza, in Wm. H. Taylor Sur., 2½ mi. NW of LaGrange townsite, dry, TD 2,530 ft.

Jones Creek Oil Co. 1 Kenny B. Krebs, in Jno. R. Jones League, 5½ mi. NE of Fayetteville, dry, TD 3,334 ft.

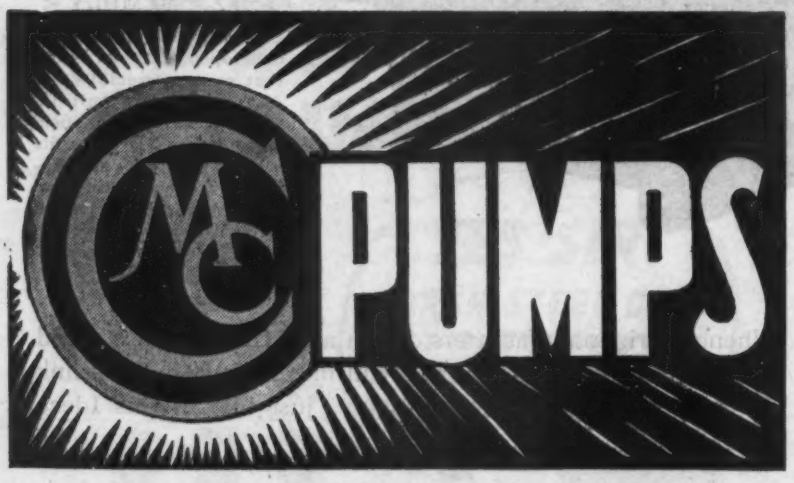
S. B. Messer 1 Susanna Haynie, in J. P. McFarland Sur., 6 mi. NW of Smithville, dry, TD 1,000 ft.

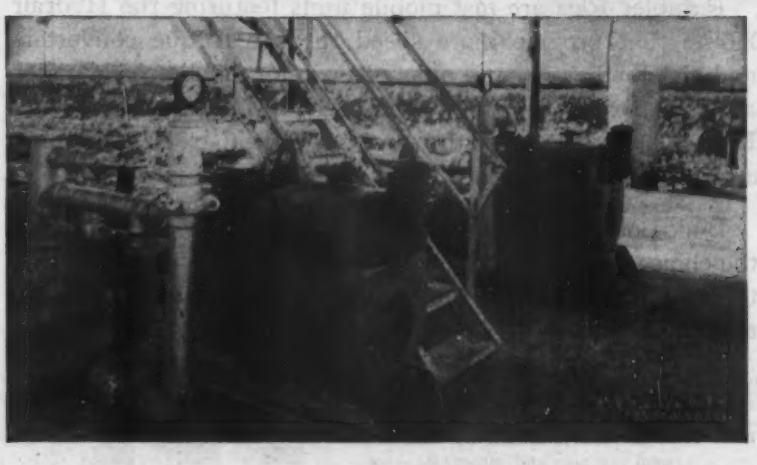
Jackson County: Texana Pet. Co. 1 Wes. Rogers, in Leonardo Mason Sur., 50 mi. SW of Edna, dry, TD 5,820 ft.

Lee County: Humble 3 Geo. D. Vick, in B. Smith League, 2 mi. E of Tanglewood townsite, dry, TD 6,404 ft.

Lee County: Gust H. Krogseth, Tr., 1 F. D. Brown, in D. Hudson Sur., 3½ mi. NE of Lexington townsite, dry, TD 6,379 ft. Edwards lime.

San Jacinto County: Butcher-Arthur, Inc., 1-E Foster Lumber Co., in Geo. Taylor Sur., in Cold Springs area, dry, TD 4,704 ft.





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APPALACHIAN FIELD

Ravenswood District Gets Two 50-Bbl. Wells

PITTSBURGH.—In Ravenswood district, Jackson County, West Virginia, two Berea oil wells were completed for 50 bbl. a day each. Parkersburg Oil & Gas Co. completed a test on the Anna L. Pepper farm and Elsworth Jordan et al a test on the W. H. Moore farm. Prior to these wells, Columbian Carbon Co. had created interest by a good Berea well on the Ashcraft lease.

In this district, United Carbon et al wildcat on the Nathaniel Waterbury farm, completed in the Oriskany sand, total depth 5,010 ft., and good for 12,000,000 cu. ft. gas, was tested and showed a rock pressure of 1,700 psi. and also increased to 14,000,000 cu. ft.

In Cologne district, Mason County, Columbian Carbon Co. topped the Berea sand in the wildcat on E. F. Durst farm at 2,144 ft. and drilled on into the shale with a gas volume of 179,000 cu. ft. initial, at 3,536 ft., which declined to 84,000 cu. ft. at 3,616 ft. In Cooper district, the wildcat on Clyde Jordan farm topped the Big Lime at 1,397 ft. with gas shows at 2,920 ft. and 3,385 ft.

New locations in this state totaled 12 and were in Crook district, Boone County; Salt Lick district, Braxton County; Ripley district, Jackson County; Poca district, Kanawha County; Skin Creek district, Lewis County; Portland district, Preston County; Curry & Teays Valley districts, Putnam County; Trap Hill district, Raleigh County; Grant district, Wayne County; and Baileysville district, Wyoming County.

On Chestnut Ridge in Georges Township, Fayette County, southwest Pennsylvania, Orville Eberly et al is clearing a location for a test on John Dulick tract. In this section, New Penn Development Co. et al have staked a location for No. 3 Mary I. Smith located 1,380 ft. south of the No. 1 and 925 ft. east of the No. 2. Both are scheduled for the Oriskany.

In Richmond Township, Crawford County, northeast part of the state, Bean & White ran 7-in. casing to 4,113 ft. in the wildcat on Harry F. White farm, shutting off black water encountered at 4,100 ft. (Newburg) and will drill ahead to the Clinton.

New locations in southwest Pennsylvania totaled four and are in South Bend Township, Armstrong County; Armstrong Township, Indiana County; Allegheny Township, Westmoreland County.

PENNSYLVANIA SUCCESSFUL WILDCAT

Westmoreland County, Bell Township: Peoples Natural Gas Co. 1 Hicks Coal Co., 925,000 cu. ft. gas, TD 1,972 ft.

WEST VIRGINIA SUCCESSFUL WILDCATS

Jackson County, Ravenswood district: Parkersburg Oil & Gas Co. 1 Anna L. Pepper, 50 bbl., Berea, TD 2,126 ft.

Elworth Jordan et al 1 W. H. Moore, 50 bbl. Berea, TD 2,100 ft.

WEST VIRGINIA WILDCAT FAILURE

Raleigh County, Shady Springs district:

Godfrey L. Cabot, Inc., 1,236 Russell & Doloff, dry, elev. 1,999 ft., Big lime 1,880 ft., Corniferous lime 6,900 ft., Oriskany 6,990-98 ft., 7,006-12 ft., 7,028-33 ft., 7,040-43 ft., TD 7,173 ft.

SOUTHWEST TEXAS

Jim Hogg County Discovery Completed

CORPUS CHRISTI.—A new discovery well approximately 6½ miles south of Armstrong field in Jim Hogg County, has been completed for an initial production of 58 bbl. of 39.9°-gravity oil per day through a ⅛-in. choke. The well, Baldridge & King et al 3 Mrs. S. K. East, located in the H&GN Survey 35, 16 miles southwest of Hebbronville, was drilled to a total depth of 3,990 ft., with 5½-in. casing on bottom. Perforations for completion were made at 3,875-85 ft. Working pressure was 890 psi. and gas-oil ratio 1,356.

Magnolia Petroleum Co. 111 A. A. Seeligson, in James H. Houghton Survey, 4 miles northwest of Premont, opened new oil pay at East Premont field, Jim Wells County. Total depth is 6,114 ft., with perforations in Zone 20 at 4,843-48 ft. On potential gage flowed 68 bbl. oil per day through a ⅛-in. choke, with ratio 280 and gravity 36.8°.

A new gas pay for La Blanca pool, Hidalgo County, has been opened by La Gloria Corp. A-1 La Blanca Subdivision unit, in Lot 196, of La Blanca Agricultural Co., Subdivision "B," This well was dual-completed flowing through perforations at 7,734-46 ft., an initial production of 18,000,000 cu. ft. of gas per day, and through perforations at 7,680-98 ft., flowing 25,000,000 cu. ft. gas per day on open flow.

Squire pool of Duval County has been extended 1 mile southwest with the completion of Santa Clara Oil Co. & John F. Camp & Sons E-2 Jas. F. Welder Heirs, in the M. G. Andrews Survey 24, 13 miles northwest of San Diego. On potential gage this well flowed 10,400,000 cu. ft. gas on open flow, with some condensate, through perforations at 3,812-27 ft. Top pay is 3,812 ft. in Yegua sand with total depth at 3,875 ft.

A new oil pay for South Longhorn pool, Duval County, has been opened at Hiawatha Oil & Gas Co. A-2 Leroy Denman, in Santa Garcia Grant, 4 miles east of Realitos. This well was dual-completed, with top of pay at 4,184 ft., in Cole sand, perforations at 4,195-4,200 ft., flowing initial production of 66 bbl. oil per day through a 5/32-in. choke; and top of pay 5,780 ft., in Hiawatha sand, with perforations at 5,782-5,787 ft., flowing an initial production of 89 bbl. of oil per day through 5/32-in. choke, gas-oil ratio 566, gravity 45.6°.

There were 38 new locations reported this week for Districts 4 and 1, of which 13 were wildcat starts, 8 in Webb, 2 in Jim Hogg, and 1 each in Caldwell, Edwards, Duval, Hidalgo, Kleberg, Nueces, San Patricio, and Williamson counties. Four successful exploratory tests were completed, opening three new pays, one each in Duval, South Longhorn pool, La Blanca pool in Hidalgo County, and East Premont field in Jim Wells County. Seven dry wildcats, two in Duval and one each in Bastrop, Edwards, Kleberg, Nueces and San Patricio counties.

SOUTHWEST TEXAS (DISTRICTS 1 & 4) SUCCESSFUL WILDCATS

Duval County: New oil pay South Longhorn—Hiawatha Oil & Gas Co. A-2 Leroy Denman, Santa Garcia Grant, 4 mi. E of Realitos, dual completion: Top pay 4,181 ft., Cole sand, new pay, TD 5,850 ft., perf. 4,195-4,200 ft., IP: 66 bbl. oil per day through a 5/32-in. choke, GOR 495, gravity 42°. Top pay 5,780 ft., Hiawatha sand, new pay, perf. 5,782-5,787 ft., IP: 89 bbl. oil per day through 5/32-in. choke, GOR 566, gravity 45.6°.

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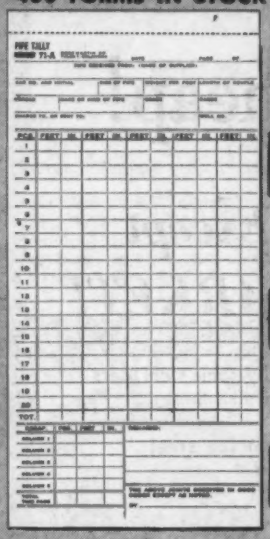

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Extension to Squire pool—Santa Clara Oil Co. & John F. Camp & Sons E-2 Jas. F. Welder Hrs., in M. G. Andrews Sur. 24, 13 mi. NW of San Diego, 1 mi. SW of Squire field, top pay 3,812 ft. Yegua sand, TD 3,875 ft., perf. 3,812-27 ft., IP: 10,400,000 cu. ft. gas open flow, with some condensate.

Hidalgo County: New gas pay La Blanca pool—La Gloria Corp. A-1 La Blanca Subd. unit, in Lot 196, La Blanca Agricultural Co. Subd. "B," ½ mi. SE of La Blanca, dual completion: Top pay 7,734 ft., TD 8,620 ft., perf. 7,734-46 ft., IP: 18,000,000 cu. ft. gas per day on open flow. Top pay 7,680 ft., perf. 7,680-98 ft., IP: 25,000,000 cu. ft. gas per day on open flow.

Jim Wells County: New oil pay East Premont—Magnolia Pet. Co. 111 A. A. Seeligson, in James H. Houghton Sur., 4 mi. NW of Premont, top pay 4,843 ft. (zone 20), TD 6,114 ft., perf. 4,843-48 ft., IP: 68 bbl. oil per day through ⅛-in. choke, GOR 280, gravity 36.8°, no water.

SOUTHWEST TEXAS (DISTRICTS 1 & 4) WILDCAT FAILURES

Bastrop County: Glass & Clark 1 J. Goertz, in C. R. Perry Sur., 8 mi. S of Hilbig field, dry, TD 2,508 ft.

Duval County: Holly Development Co. 1 Duwel Co., in GH&H Sur. 95, 13½ mi. N of San Diego, dry, TD 4,750 ft.

M. L. Massingill 1 Hal A. Hamilton, in BS&F Sur. 115, in extreme NE cor. of Duval County, dry, TD 4,236 ft.

Edwards County: Creslenn Oil Co. 1-A Fred Earwood, in GCSD&RGNG Sur. 16, 2 mi. S of Turney field, dry, TD 1,005 ft.

Kleberg County: Humble T-2 King Ranch-Stratton, in Santa Gertrudes Grant, in Stratton area, dry, TD 8,000 ft.

Nueces County: Renwar Oil Corp. 1 M. M. Gabriel, in Enrique Villareal Grant, 1 mi. SE of Saxet field, dry, TD 9,002 ft.

San Patricio County: Rock Hill Oil Co. 1 Ira S. Hunt, Sec. 21, Geo. H. Paul's Subd. of J. J. Welder Ranch, 2 mi. SW of St. Paul, dry, TD 6,602 ft.

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5-30

PERMIAN BASIN

Sun Arledge Field Test To Drill to Ellenburger

MIDLAND.—Sun Oil Co. 2 J. W. Arledge, northeast confirmation test to its Arledge field opener in northern Coke County, has been given up in the Marble Falls limestone section and will continue ahead to the Ellenburger. Work had been held up by a fishing job for drill pipe, and on last report it was coring ahead in black shale at 6,664 ft.

In north Pecos County, Chancellor, Slick et al 1 Thornton Davis, was preparing to drill cement plugs from 5-in. casing set at 9,793 ft., 2 ft. off bottom. Operators were to recement three times behind the pipe before starting tests on the Ellenburger section.

Humble Oil & Refining Co. 2 Elizabeth Childress, east offset to its 1 Mrs. Grady Mitcham, discovery and only producer in Childress Ellenburger field of northeast Crockett County, perforated casing between 8,104-30 ft. It swabbed down 5,000 ft., recovering a small amount of gas and no oil. Swabbing continued.

A ½-mile north stepout to Shafter Lake Devonian field in Andrews County, that is ¼ mile farther north of Gulf's 1-GG, which produced from both the Wolfcamp and Devonian, was staked by Sinclair Prairie Oil Co. this week. The new well will be the 1-154 University, Section 24, Block 13, University Lands. Sinclair also has taken over a wildcat staked by Dan Auld of San Antonio, in Section 13, Block A-36, PSL Survey. Location is 1¾ miles east of the Shafter Lake Devonian area and is on farmout acreage from Atlantic Refining Co. Sinclair redesignated the test as its 1 J. M. Stevenson. It is slated to 9,500 ft.

Champlin Refining Co. reported the oil exhausted after continued testing in its 1-D University, Section 26, Block 13, University Lands, ¾ mile west of Shafter Lake production. In 18 hours of swabbing, it recovered 180 bbl. of oil and 162 bbl. of water, from perforations at 8,165-8,249 ft. Operators were to squeeze and test in the Wolfcamp, which is also productive in some wells of the Shafter Lake field.

Plymouth Oil Co. 1 Willie Mae Foster, 11½ miles northwest of Sterling City, acidized the Strawn from 8,185-8,200 ft. and swabbed 35 bbl. of fluid, being 11 bbl. oil and the remainder water, in 10 hours. It was shut down for orders.

Anderson-Prichard Oil Co. and Vickers Petroleum Co. 1 Marvin Frances Foster, lower Permian discovery 7½ miles south of Sterling City, now continuing to the Ellenburger, was drilling below 6,500 ft.

In Crane County, 1 mile north of the University-Waddell Ellenburger discovery, Gulf Oil Corp. 111-E Waddell, Section 22, Block B-25, PSL Survey, reported a third successful drill-stem test from 9,024-48 ft. Open 2 hours on the test, it blew gas estimated at 200,000 cu. ft. a day, and recovered 1,000 ft. of clean oil, and 220 ft. of oil and gas-cut mud. Operators were to deepen and make further tests.

Oil Carriers, Inc., of Chicago, 1 Mac Pray-State, 12,000-ft. wildcat test 3 miles west and ¾ mile north of the Benedum discovery in Upton County, was drilling below 4,530 ft. On an elevation of 2,703 ft., the well had top of the limestone at 3,750 ft., and according to reports, was running some 125 ft. low on correlations to Slick-Urschel Oil Co. and Plymouth's 1 D. L. Alford. The 1 Pray-State is in Section 38, Block Y, TCRR Survey.

WEST TEXAS (DISTRICTS 8 & 7-C) SUCCESSFUL WILDCATS

Hale County: Humble Oil & Refining Co. 1 J. A. Lutrick, Sec. 14, Blk. D-8, EL&RR Sur., 6½ mi. NE Abernathy, flowed 162 bbl. 41°-gravity oil a day, ¼-in. choke, Pennsylvanian limestone (Cisco), topped 7,910 ft., TD 7,987 ft., elev. 3,301 ft., GOR 414 cu. ft., casing

pressure 115 psi., tubing pressure 125 psi.

Pecos County: Jergins Oil Co. 1 Iowa Realty Trust Co., Sec. 125, Blk. 10, H&GN Sur., 3 mi. E Fromme field, TD 1,875 ft., PB 880 ft., completed as gas well and shut in, estimated 3,500,000 cu. ft. gas a day.

WEST TEXAS (DISTRICTS 8 & 7-C) WILDCAT FAILURES

Andrews County: Stanolind Oil & Gas Co. 1 H. M. Ford, Sec. 19, Blk. A-43, PSL Sur., 5 mi. SW Andrews, dry, TD 5,000 ft., Grayburg 4,200 ft., elev. 3,190 ft.

Union Oil Co. of California 1-A J. D. Biles, Sec. 9, Blk. A-31, PSL Sur., 1½ mi. NW Union field, dry, TD 8,565 ft., San Andres 4,390 ft., Clearfork 6,080 ft., Woodford 8,525 ft., elev. 3,396 ft.

Borden County: Tide Water Associated Oil Co. 1 Clayton & Johnson, Sec. 47, Blk. 31, T&P Sur., 9½ mi. S Gail, dry, TD 9,162 ft., San Andres 2,680 ft., Mississippian 8,730 ft., Ellenburger 9,077 ft., elev. 2,374 ft.

Crosby County: Continental Oil Co. 1 Swenson Land & Cattle Co., Sec. 75, Blk. 2, H&GN Sur., 17 mi. SE Crosbyton, dry, TD 8,413 ft., San Andres 1,560 ft., Glorietta 2,600 ft., Mississippian 7,780 ft., Ellenburger 8,250 ft., pre-Cambrian 8,385 ft., elev. 2,454 ft.

Ector County: F. W. Shield et al 1 Walter Cowden, Sec. 16, Blk. 42, T&P Sur., 5 mi. S Odessa, dry, TD 4,738 ft.

Runnels County: Ralph Stewart 1 J. W. Barr, C. Montez Sur., 10 mi. SE Ballinger, dry, TD 3,208 ft.

Val Verde County: Chas. Mauer 2 Ingram, Sec. 73, Blk. B-2, EL&RR Sur., 8 mi. NW Shumla, dry, TD 1,785 ft., show of oil 1,650 ft.

Winkler County: Amon G. Carter 1 fee, Sec. 24, Blk. B-6, PSL Sur., 5 mi. E Halley, dry, TD 1,255 ft., San Andres 4,180 ft., San Angelo 5,210 ft., Mississippian 8,820 ft., Devonian 10,030 ft., Simpson 11,240 ft., McKee 11,720 ft., Ellenburger 12,438 ft., elev. 2,869 ft.

SOUTHEASTERN NEW MEXICO

HOBBS.—Magnolia Petroleum Co. 1-A Santa Fe, in the Crossroads area of northeast Lea County, SE SE 30-9s-36e, logged additional shows of oil in the San Andres in drilling to 4,889 ft. Acid treatment from 4,832-40 ft. resulted in pumping a small amount of oil and water. Operators were setting packer at 4,859 ft. for a drill-stem test.

Magnolia's wildcat test, the 1-W State, SW SE 16-21s-22e, 27 miles west of Carlsbad, was drilling below 7,426 ft. in lime and shale, toward its goal of 7,500 ft. It topped the Pennsylvanian at 5,100 ft.

Southern Union Producing Co. 1 Elliott, 24-18s-23e, southwest of Artesia, was below 3,705 ft. on last report. It had top of the Glorietta at 1,465 ft.

In Lea County, Mid-Continent Petroleum Corp. 1-A Sawyer, 27-9s-36e, was reported drilling below 11,397 ft. Little information has been released on the well. It had top of the anhydrite at 2,192 ft., salt at 2,325 ft., and the San Andres at 4,110 ft.

SOUTHEAST NEW MEXICO SUCCESSFUL WILDCAT

Lea County: Shell Oil Co., Inc., 1 Taylor-Glenn, 3,226 ft. from north and 1,980 ft. from west line, 3-21n-37e, east outpost to Hardy shallow production, flowed 12,000,000 cu. ft. gas a day, plus 30 bbl. distillate per 1,000,000 cu. ft., TD 8,590 ft., PB 6,720 ft., gas on first drill-stem test at 5,342-76 ft., Glorietta 5,250 ft., Tubbs 6,230 ft., base Permian 7,470 ft., elev. 3,484 ft.

SOUTHEAST NEW MEXICO WILDCAT FAILURES

Chaves County: Manry & Co. 1 State, SE SE 26-11s-31e, dry, TD 4,285 ft., anhydrite 1,444 ft., Yates 2,204 ft., Queen sand 2,947 ft., San Andres limestone 3,485 ft., elev. 4,453 ft.

Lea County: Culbertson & Irwin 1 Murray, SW SE 9-22s-32e, dry, TD 5,053 ft., Lelaware lime 4,865 ft., sand 4,950 ft., elev. 3,814 ft.

MISSISSIPPI

La Grange Field Baker Sand Well Completed

JACKSON.—In La Grange field extension area, Adams County, James E. Kemp 1 Elizabeth B. Stanton, 34-7n-2w, has been completed as one of the better Baker sand wells in the field. After perforating 6,212-6,217 ft., the well was tested, flowing 171 bbl. of 39.1°-gravity oil per day through a 10/64-in. choke; tubing pressure 440 psi. at the end of the test. Kemp is now rigging up to drill No. 2 Stanton, 34-7n-2w, 1,100 ft. north and 100 ft. west of No. 1 Stanton, and is building roads to drill No. 1 Mrs. Fannie Green-Stanton, 90-7n-2w, approximately 2,100 ft. southwest of No. 1 Stanton, and 1,300 ft. northwest of Kemp 4 H. M. Marks.

Also at La Grange, Sohio-Roeser and Pendleton 1 De Marco, 8-6n-2w, is preparing to make pumping tests for completion.

In Yellow Creek field, Wayne County, Humble Oil & Refining Co. B-3 G. M. & O. Land Co., east offset to the discovery well, has been completed through perforations at 5,072-5,115 ft. in the Stanley sand. After encountering trouble the first few days, the well has been completed pumping 168 bbl. of oil and 42 bbl. of salt water per day.

There were eight new locations reported this week, all in proven areas, three in La Grange field, Adams County, two in Cranfield field, Adams County, and one each in Baxterville field, Lamar County; Gwinville field, Jeff Davis County and Mallalieu field, Lincoln County. Three wildcats were dry, one each in Clarke, Perry and Wayne counties.

MISSISSIPPI WILDCAT FAILURES

Clarke County: C. L. Higgason et al 1

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J. W. Bass, 27-1n-15e, dry, TD 4,999 ft. Top Wilcox 880 ft., Midway 2,793 ft., Selma 3,279 ft., Eutaw 4,414 ft., Tuscaloosa 4,922 ft.

Perry County: Salt Dome Oil Corp. 1 Masonite Corp., 2-3n-11w, dry, TD 9,016 ft., tops: Lower Tuscaloosa 8,460 ft., Massive sand 8,786 ft.

Wayne County: William Cordell 1 School Land, 16-7n-5w, dry, TD 7,337 ft., top Tuscaloosa 5,787 ft., Marine Tuscaloosa 6,622 ft., Base Marine Tuscaloosa shale 6,819 ft., Massive sand 6,995 ft., Comanche 7,267 ft.

N. CENTRAL TEXAS

Goldsmith Field KMA Production Extended

WICHITA FALLS.—A ¾-mile northeast extension to KMA sand production at the Goldsmith field flowed an estimated 60 bbl. of oil an hour after a shot of nitro at 3,880-3,911 ft. The new well, Roger H. King and associates 1 Mrs. Frances Morgan, Block 1, Margaret Ramsey Survey, A-471, 4 miles north of Holliday, topped the KMA limestone formation at 3,806 ft., and the sand at 3,880 ft. It ran approximately 18 ft. high on the sand zone, correlated with other producers in the area. After the 56-qt. shot, the well cleaned itself and flowed through open casing. The new producer is expected to open considerable acreage for further drilling.

S. D. Johnson et al 1 G. W. Scaling, discovery 3 miles south of Halsell in Clay County, has opened a new deep field. Operators perforated the section between 5,807-37 ft. with 180 shots and had started to displace the water when the well blew in. It was allowed to flow into pits for a time, then put 173 bbl. of oil, with no water, into tanks. The flow was through ¾-in. choke, over a period of 3 hours. Gravity of the oil was 45°. Another report on the 1 Scaling placed the pay zone between 5,798-5,838 ft.

The new Queen's Peak conglomerate field of southern Montague County was assured of a confirmation well on the north offset location at The Texas Co. and Continental Oil Co. 1 B. H. Bates, Block 1, Limestone County School Land Survey. A 1-hour drill-stem test between 6,322-35 ft. brought gas to the surface in 4 minutes and recovered over 5,000 ft. of clean oil. Bottom-hole pressure was 2,500 psi. Operators cored ahead from 6,335-43 ft., recovering 5 ft. of hard, medium-grained sand, 2 ft. of sandy conglomerate and 1 ft. of hard, medium-grained sand with a faint odor of oil. A second drill-stem test was to be made.

S. D. Johnson and Acme Die & Machine Co. 1 Wines, western Clay County wildcat in Lot 4, Block 1, Clark and Plumb Survey, perforated from 6,080-85 ft., in the base of the Simpson, and swabbed with no results. Top of the Simpson was placed at 5,990 ft., and a previous test from 6,035-87 ft., the recovery was 900 ft. of oil in 1½ hours.

NORTH CENTRAL TEXAS (DISTRICTS 7-B & 9) SUCCESSFUL WILDCATS

Clay County: S. D. Johnson et al 1 C. W. Scaling, Sec. 3, HT&B Sur., A-211, 4½ mi. NW Deer Creek, flowed 172.9 bbl. 45°-gravity oil in 3 hours, ½-in. choke, casing pressure 350 psi., tubing pressure 220 psi., GOR 450 cu. ft., perf. 5,798-5,838 ft., TD.

Jones County: Geochemical Surveys 1 J. R. Simpson, Sec. 18, Blk. 16, T&P Sur., 4 mi. SW Hawley, pumped 119 bbl. 45°-gravity oil a day, Hope limestone 2,271-76 ft., TD.

Stephens County: Texas Pacific Coal & Oil Co. 1 C. L. Tramell, Sec. 42, Blk. 8, T&P Sur., 6½ mi. SW Breckenridge, flowed 4,200,000 cu. ft. gas a day, ⅝-in. choke, top Mississippi 3,829 ft., perf. 4,127-32 ft., TD 4,415 ft., shut-in pressure 1,700 psi.

NORTH CENTRAL TEXAS (DISTRICTS 7-B & 9) WILDCAT FAILURES

Archer County: Akin & Dimock 1 L. F. Wilson, Blk. 115, ATNCL Sur., 7 mi. NW Archer City, dry, TD 4,110 ft.

Brown County: J. L. White et al 1 C. E. Thompson, Blk. 34, Comanche CSL, 2 mi. N. Blanket, dry, TD 2,400 ft. in black shale.

Cooke County: C. R. Craig et al 1 W. A. Erwin, J. Armendaris Sur., 2 mi. S Marysville, dry, TD 1,504 ft. in shale.

E. A. Dawson 1-A J. J. Raiser, J. Worley Sur., 6½ mi. SE Gainesville, dry, TD 1,196 ft., bailed show of oil and water in sand at TD.

Fisher County: Texas Pacific Coal & Oil Co. 1 Celotex Corp., Sec. 10, Blk. E, Sallie English Sur., 2½ mi. SW Hamlin, dry, TD 5,369 ft., Dothan 2,725 ft., Noodle Creek 3,045 ft., Flippen 3,088 ft., Palo Pinto 5,145 ft., swabbed 2 per cent oil from perf. at 3,089-90 ft.

T. A. Kirk et al 1 B. R. Eaton, Sec. 183, Blk. 2, H&TC Sur., 3½ mi. NE Rotan, dry, TD 3,524 ft., Valera 2,440 ft., Noodle Creek 3,450 ft.

Jones County: Eastland Oil Co. 1 J. J. Steele, Harrison CSL 334, 8 mi. NW Anson, dry, TD 3,076 ft., Saddle Creek 2,545 ft., coal 2,603-05 ft., Flippen 2,675 ft., Swastika 3,036-76 ft.

King County: Stanolind Oil & Gas Co. 3 R. B. Masterson, F. P. Knotts Sur., NE cor. of county, dry, TD 4,315 ft., Coleman Junction 2,492 ft., Reef 4,302 ft.

Nolan County: Skelly Oil Co. 1 W. H. Bradberry, Sec. 67, Blk. 20, T&P Sur., 13 mi. SE Sweetwater, dry, TD 6,913 ft., Valera 2,335 ft., Noodle Creek 3,315 ft., Saddle Creek 3,355 ft., Ellenburger 6,257 ft., Hickory sand 6,670 ft., no commercial shows, elev. 2,347 ft.

Young County: R. C. Lipscomb 1 Anna Stovall, Sec. 2,948, TE&L Sur., 3 mi. W New Castle, dry, TD 4,700 ft., show of gas 4,207 ft.

KANSAS

Barber County Wildcat Has Good Shows

CASING has been set to test three oil and gas shows in the Mississippian at the Superior Oil Co. 1 Ott, SW NE SW 6-34s-13w, Barber County. The first drill-stem test recovered 3,640 ft. of oil and gas-cut mud and water in 1 hour from 4,871-4,902 ft. The second had gas in 5 minutes and recovered 450 ft. of gas-cut mud and 1,190 ft. of oil-cut mud in 45 minutes from 4,871-4,945 ft. A third test at 4,968-87 ft. had gas at the surface in 8 minutes and recovered 330 ft. of oil-and-gas-cut mud and muddy oil in 1½ hours. The top of the Mississippian was called at 4,869 ft. The well is located about 2 miles south of the Medicine Lodge gas pool.

The Continental Oil Co. 1 Werner, SW SE NW 7-9s-18w, has been completed in the Arbuckle with a maximum potential of 3,000 bbl. per day to give the Southeast Barry pool in Rooks County an extension to the northeast.

In Sumner County, the Anderson-Prichard Oil Co. and Consolidated Gas Utilities Co. 1 Frantz, wildcat near the abandoned Anson pool, has been completed in the Mississippian for a potential of 38 bbl. of oil per day. Top of Mississippian was called at 3,736 ft. and total depth was 3,779 ft.

A total of 53 completions and 52 locations were recorded for the week. Barton County led in completions with 9, followed by Russell with 5, and by Butler and Rice with 4 each. Barton and Rice each had 7 new locations for the week.

KANSAS SUCCESSFUL WILDCAT

Rooks County: Nadel & Gussman and L. C. Hay 1 Marcotte, NW NW SW 26-9s-20w, completed in the Arbuckle at 3,803-14

ft. for 3,000 bbl. of oil per day, TD 3,814 ft.

KANSAS WILDCAT FAILURES

Osborne County: Westgate-Greenland et al 1 Dean, SW SW SW 5-8s-14w, dry, TD 3,764 ft.

Barton County: Helmerich & Payne 1 Schmidt "A," SW SW NW 30-20s-15w, dry, TD 3,965 ft.

Sedgwick County: J. P. Gaty et al 1 Tjaden, NE NE NW 29-26s-2e, dry, TD 2,983 ft.

ROCKY MOUNTAIN

Rocky Mountain Depth Record Set by Pure

DENVER.—A new depth record for the Rocky Mountain area has been established by Pure Oil Co. in the central section of the state at West Poison Spider. The well is 1 Unit, C NW SE 11-33n-84w, now drilling below 13,500 ft. Pure shot the area in 1946 and 1947 and early in 1947 acquired leases and unitized a 15,873-acre block. Subsequently the company leased additional lands trending northwest and southeast along the axis of the anticline. Small shows of oil have been encountered in the test, but drill-stem tests have failed to show commercial production.

At present depth the well is believed to be in upper Cretaceous beds, with Frontier sand expected within the next few hundred feet. The operator has not released formation tops on the well, pending completion of the operation. This well is in the southwestern area of the Powder River Basin, 15 miles west of Poison Spider field, which produces oil from the Sundance and has been drilled to granite at around 4,100 ft.

Ohio Oil Co. has abandoned its wildcat test of the South O'Brien Springs area, Carbon County, Wyoming, as a dry hole in the Dakota at 2,515 ft. Top of the Dakota was logged at 2,004 ft. and drill-stem tests of that horizon showed water. The well is 1 Johnson, SW NW NE 26-24n-88w, 4 miles south of a well drilled by Continental Oil Co. 6 years ago that found the Tensleep hard, tight and dry. This area has been seismographed by several operators and was core-drilled a year ago by Kerr-McGee Oil Industries, Inc. The area has been of interest because of its location southeast of the Lost Soldier-Wertz fields, which have produced oil for a number of years.

Mechanical difficulties are still delaying completion of Seaboard Oil Co.'s wildcat test in the Silver Tip area, Park County, Wyoming, 5 miles west of the Elk Basin field. The well, at 53-33 NPRR, NW SW NE 33-58n-100w, had shows of oil in the Peay (Frontier) and Phosphoria formation, and after being drilled to 9,507 ft. in the Madison was plugged back to 8,558 ft. for a test of the Phosphoria. A hole developed in the casing and the operator has perforated and squeezed this section before completing tests of the Phosphoria. On drill-stem test the well made 800 ft. of 42°-gravity oil with an estimated 1,000,000 cu. ft. of hydrogen-sulfide gas between 8,495-8,525 ft. Seaboard is now drilling a second well southeast of the deep test and this well is now below 4,200 ft. for a test of the Frontier formation.

Slight shows of oil have been encountered by Phillips Petroleum Co. and Kerr-McGee Oil Industries, Inc., in the deep test of the Sheldon Dome structure at 1 Arapahoe, C NW NW 15-5n-2w (WRM), Fremont County, Wyoming. Top of the Basal Amsden sand was logged at 7,300 ft. and staining was found in streaks between 7,360-7,390 ft. Top of the Madison was at 7,390 ft. and that formation was hard and tight. Slight oil staining was found in fractures of the lime. The operator is now drilling below 7,512 ft. in the Madison. If the well is not commercial in these formations it will be plugged back for further tests of the Tensleep, which indicated on tests that it would produce more than 100 bbl. of oil daily. In the Tensleep the well will establish a new pay for the field. Oil was discovered at Sheldon by Carter Oil Co. and Phillips 2 years ago and the well finally was completed as an Embar formation producer, with the Tensleep showing hard and tight. In the present test Embar had no saturation, with evidence of a fault between the two wells established.

Location is now being made and roads built for an important wildcat by Pure Oil Co. in the Salt Basin of Colorado, at the Gateway area in Mesa County. The well will be in the NW SW SW 15-15s-104w, and is based on a combined structural and stratigraphic trap play made by Pure last year.

New operations.—A total of 10 new locations were made in the Rocky Mountains, with 5 in Wyoming, 2 in Colorado, and 3 in Montana. Four of the wells were deepenings in the Wertz and Lost Soldier fields, Sweetwater County, Wyoming, where Sinclair Wyoming Oil Co. within the last few months has found oil in new horizons.

Completions.—Seventeen completions were listed in the Rocky Mountain area during the week, of which seven were in Wyoming, five in Colorado and five in Montana. Total initial production for all wells was 2,555 bbl. of oil. Included in the completions for the week are The Texas Co.'s wildcat discovery at Adon, Big Horn County, Wyoming, in the center of the Powder River Basin. This well started an active leasing play through this Basin, although its pumping initial of 244 bbl. of oil in 24 hours may not make the present test too profitable. Sinclair Wyoming Oil Co. gave final completion to its Wertz field, Carbon County, Wyoming, Amsden discovery with an initial of 595 bbl. of oil per day through

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1-in. choke. There are now eight rigs running in Wertz and Lost Soldier fields following the discovery of Amsden oil at Wertz and Madison oil at Lost Soldier. Other completions for the three states were pool wells.

WYOMING SUCCESSFUL WILDCATS

Adon, Campbell County, Texas 1 Unit, C NW NE 2-52n-72w, 9,945 TD, PB 9,012, pumped 244 bbl. oil per day, 31.5° gravity, Frontier 6,395, Thermopolis 7,170, Muddy 7,365, Dakota 7,615, Morrison 7,865, Maroon Jurassic 7,960, Chugwater 8,123, Minnekahta 8,925, Opeche 8,941, Minnelusa 8,997, Madison 9,765. Elev. 4,358 KB.

Wertz, Sweetwater County: Sinclair-Wyoming 22 Unit, CEL SE SE 1-26n-90w, 6,635 TD, flowed 595 bbl. per day through 1-in. choke; Amsden 6,420, Basal Amsden 4,480, Madison 6,580, 7-in. casing 5,856, perf. 456 holes 6,494-6,570, OWDD OTD 6,221. Elev. 6,989.

CALIFORNIA

Recompletion in Rincon Flows 339 Bbl. of Oil

LOS ANGELES.—Chanslor-Canfield Midway Oil Co. has opened a new pay zone in the Rincon field with the recompletion of its B-47 Hobson, 16-3n-24w. The new pay zone at 3,210-3,355 ft. yielded an initial flow of 339 bbl. of 30.5°-gravity oil daily, cutting 12 per cent water, along with 73,000 cu. ft. of gas.

The B-47 Hobson is believed to be the most southeasterly well in the Rincon field, but it actually may be producing from the main Padre Canyon field accumulation due to complex faulting of the area. Structurally, the Rincon-Padre Canyon-San Miguelito area is divided into three main fault blocks by the Red Mountain and Padre faults. Production from the Rincon and Padre Canyon areas is obtained respectively from the Rincon and North Anticlines, both of which are faulted anticlines lying in the central fault block. Edge wells of all the three fields have passed through faults prior to encountering production, and it is often difficult to establish just which accumulation is actually producing the oil regardless of the surface location of the well.

The new zone, uncovered by recompletion of the B-47 Hobson, is interesting in that it lies above previously known producing horizons in the area. Practically all of the Rincon area production to date has come from the lower 1,400 ft. of the upper Santa Paula (Pliocene). This has been divided into three zones: the Top, approximately 50 ft. thick; the Intermediate, 100 to 400 ft. thick; and the Miley, about 800 ft. in thickness. Faulting, and perhaps to some extent lithologic gradation, have made oil accumulation so erratic throughout the three zones that it is almost impossible to tell in advance what to expect from any new well. It has been established definitely, however, that the producing zone in the B-47 Hobson is several feet higher than the so-called Top, or shallowest, producing zone.

The Cuyama Valley area of San Luis Obispo County received another new exploratory venture last week when the Navy Oil Co. spudded in its 1 Kirschenmann, 12-10n-27w. This new test is located about 5 miles north of Norris Oil Co.'s recent discovery well in the Cuyama Valley and is not far from an old venture drilled by the Cuyama Oil Corp. to 3,900 ft. without success. So far the Norris discovery is the only producing well in the area, although several other tests have been drilled since its completion. Known as the 2 Cuyama, 25-11n-28w, the discovery well currently is producing 45 bbl. of 21.0-gravity oil, cutting 65 per cent water, daily through a 7/64-in. choke.

CALIFORNIA WILDCAT FAILURES

Kern County, McKittrick Area: The Texas Co. 16-28 Tulare NCT One, 28-30s-22e, dry, elev. 1,403 ft., TD 6,249 ft.

Los Angeles County, East Los Angeles Area: Richfield Oil Corp. 1 L. A. River Fee, 34-1s-13w, dry, elev. 255 ft., TD 4,618 ft.

OKLAHOMA

Test Indicates Big Oiler For North Lindsay

THE Cities Service Oil Co. 1 Ramsey, C SW NE 22-5n-4w, North Lindsay pool in McClain County, on second drill-stem test flowed 96.13 bbl. of oil in 75 minutes through ½-in. chokes. Test was made from 10,889-10,961 ft.

The Sam A. King 1 Amory, SW SW NW 28-7n-8e, has discovered another pay zone in the Fish field near the Hughes-Seminole County line. The well was drilled to 3,178 ft. in the Cromwell which did not show as commercial. Operator backed up to test the Booch sand at 2,770 ft. but pipe was wrecked when the sand was shot. Casing then was cemented at 1,300 ft. and perforations made at 1,163-80 ft. Well filled with 300 ft. of oil naturally and swabbed 25 bbl. per day from the Calvin sand.

Continental Oil Co. is still testing at 1 Dyer, C NW SW 31-2n-7w, Stephens County well in the South Marlow gas-distillate pool. Crew swabbed oil at the rate of 5½ bbl. per hour for 6 hours on a test at 8,105-06 ft. The well also had oil on a test at 8,073-8,110 ft.

Two new locations between the Ceres South and Ceres Southeast pools in Noble County will leave only three undrilled spots between the two pools. The latest locations are the Kingwood Oil Co. 5 Bolay, SW NE NW 35-23n-1w, on the northeast of the Ceres South pool and the Fidelity Royalty et al 2 Burnside, SE NW SE 26-23n-1w, on the southwest edge of the Ceres Southeast pool.

The Texas Co. 1 Harrell "B," NW SW SE 3-1n-5w, between Doyle and West Doyle pools in Stephens County, is coring in the Bromide. The Bromide dense was called at 11,386 ft. and the first Bromide at 11,884 ft. A core from 12,022-42 ft. showed hard to medium sand with slight stain and odor. Operator cored ahead from 12,042-62 ft. and recovered 20 ft. of hard sand with oil staining and odor.

OKLAHOMA SUCCESSFUL WILDCATS

Carter County: Magnolia Pet. Co. 4 Hightower, NE SW NE 30-1s-3w, 28 bbl. 28.3°-gravity oil per day from 3,185-3,203 ft., TD 6,200 ft.

Creek County: Flynn Oil Co. 1 Jones, SE SE NW 18-17n-8e, 35 bbl. of oil per day from sand at 3,230-76 ft., TD 3,668 ft.

Oklahoma County: Harper-Turner 1 Kramer, C SW NW 13-12n-2w, 11½ bbl. of distillate per day through 20/64-in. tubing choke from 6,210-45 ft., TD 6,271 ft.

Grant County: Phillips Petroleum Co. 1 Hall, NE NE SE 9-25n-7w, 6 bbl. distillate through 8/64-in. tubing choke and estimated 1,500,000 cu. ft. of gas per day from the Oswego lime at 5,114-90 ft., TD 5,525 ft.

OKLAHOMA WILDCAT FAILURES

Cotton County: Kadane 1 Ter-Chook-Su, NE NW NE 30-2s-10w, dry, TD 2,355 ft.

Tillman County: D. H. Bolin 1 Daugherty, SE SE SE 33-4s-15w, dry, TD 2,210 ft.

Hughes County: Morgan 1 Ramsey, SE SE NE 17-7n-10e, dry, TD 3,879 ft.

Creek County: Texon 1 Tiger, NW SW NE 15-16n-8e, dry, TD 3,308 ft.

Kay County: Peel 1 Warren, NW NW NE 32-29n-4e, dry, TD 1,630 ft.

Stephens County: Barnsdall Oil Co. 1 Glover, SW SW SE 6-2n-4w, dry, TD 8,963 ft.

Garvin County: A. R. McElreath and W. W. Harvey 1 Longmire, NW NW NW 24-3n-1w, dry, TD 4,243 ft.

Oklahoma County: Harper 1 Martz, C SE SW 13-14n-3w, dry, TD 6,095 ft.

Noble County: H. E. R. Drilling Co. 1 Dolezal, SW SW SW 8-22n-1w, dry, TD 5,381 ft.

Alfalfa County: C. L. Carlock 1 Shutt, C SW NE 13-25n-12w, dry, TD 6,087 ft.

ILLINOIS

Good Wildcat Completed In Jefferson County

MATTOON.—The William H. McKain 1 Lee Cooke et al, SE SE NW 12-2s-3e, Jefferson County, has been completed with an initial pumping production of 360 bbl. per day from the McClosky lime. Production is from 2,871-74 ft. and total depth is 2,875 ft.

The Cities Service Oil Co. 1 R. T. Bryant, SE SE SW 5-2s-9e, Wayne County, has been completed in the Aux Vases at 3,228-46 ft. for an initial production of 58 bbl. per day. Total depth was 3,480 ft. plugged back to 3,254 ft. On a drill-stem test at 3,336-56 ft. the well had a show of oil but plenty of salt water.

The Gilliam Drilling Co. 2 G. Seitz et al, 23-1s-13w, Wabash County wildcat, which was last reported to have set pipe to test the McClosky lime, is flowing natural at the rate of near 40 bbl. per hour from 2,600-06 ft. in the McClosky. The discovery well in the area produced from the Cypress sand at 2,278-86 ft. The 2 Seitz opens a new pay zone in the pool.

In Clay County, the Wiser Oil Co. 1 Lillie Hunley, SW NE NE 8-3n-8e, has been

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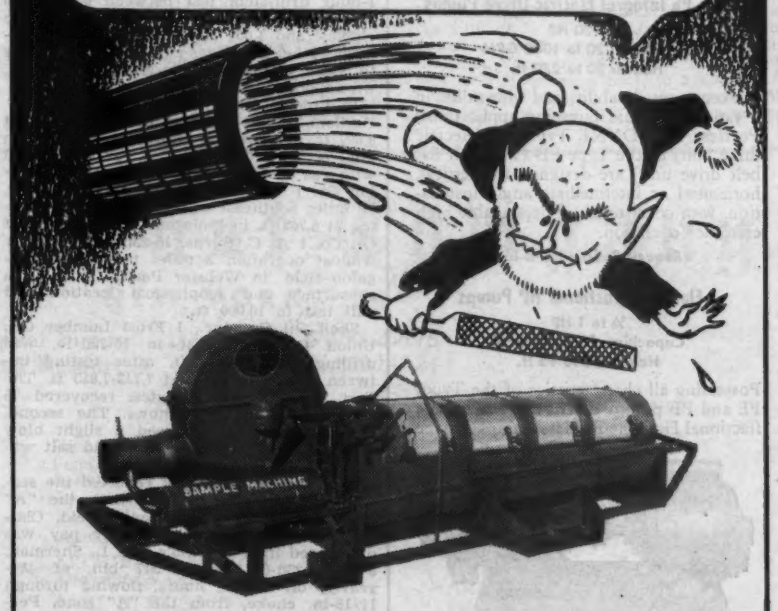

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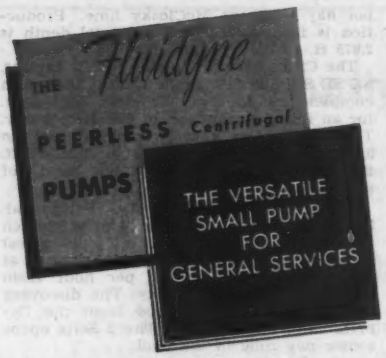

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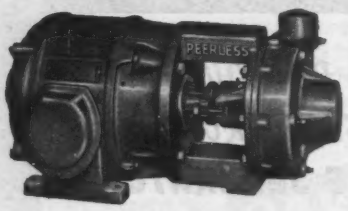

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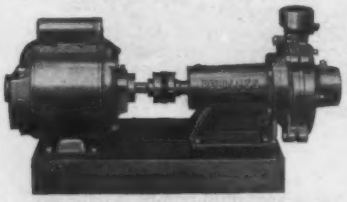

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completed at 3,009-15 ft. in the Rosiclare for an initial production of 875 bbl. per day. Total depth was 3,101 ft. plugged back to 3,050 ft.

ILLINOIS SUCCESSFUL WILDCATS

Jefferson County: W. R. McKain 1 Cooke, SE SE NW 12-2s-3e, McClosky lime at 2,871-74 ft., IP 360 bbl. of oil per day, TD 2,875 ft.

Wayne County: Cities Service Oil Co. 1 Bryant, SE SE SW 5-2s-9e, Aux Vases at 3,228-46 ft., IP 58 bbl. of oil per day, TD 3,480 ft.

ILLINOIS WILDCAT FAILURES

Marion County: Diamond Oil Co. 1 Hopkins, NE SW NE 22-3n-2e, dry, TD 2,438 ft.

Clay County: Phillips Petroleum Co. 1 G. Frost, SE SW SE 4-3n-6e, dry, TD 2,000 ft.

Gallatin County: Herndon Drilling Co. 1 Utley, NE NW SE 34-7s-8e, dry, TD 2,941 ft.

LA.-ARK.

No Commercial Production Seen in Cotton Valley Test

SHREVEPORT.—Carter Oil Co. 1 Gandy, 28-19n-7w, Claiborne Parish test, was apparently given up insofar as commercial production in the Cotton Valley group is concerned. The last set of perforations to be tested in the Cotton Valley, according to reports, was between 9,988-10,002 ft. A 1-hour drill-stem test between 9,963-10,050 ft., using ⅜-in. bottom and ¼-in. top chokes, and 1,000 ft. of water cushion, recovered 540 ft. of gas-cut mud. Plans were to start a series of tests in the Pettit, where porosity was logged at 6,612-30 ft.

In Lincoln Parish, W. C. Feazel 1 C. C. Barham, 21-20n-3w, was drilling ahead at 8,697 ft. in limestone and shale. Cores from 8,661-74 ft. recovered 6 ft. of tight sand with gas odor. In Winn Parish, Delta Drilling Co. 1 Tremont Lumber Co., 15-10n-1w, 11 miles southeast of Winnfield, was drilling at 6,762 ft. in limestone and shale. Hunt Oil Co. 1 A. C. Burns, 16-23n-9w, is a new wildcat operation 2 miles north of Shongaloo field, in Webster Parish. It is on a subsurface and geophysical location and will test to 10,000 ft.

Shell Oil Co., Inc., 1 Frost Lumber Co., Union Parish wildcat in 15-22n-1e, was drilling below 7,825 ft. after testing between 7,659-7,700 ft., and 7,743-7,813 ft. The first test, open 30 minutes, recovered 75 ft. of mud, with no shows. The second, open 10 minutes, produced a slight blow and recovered 260 ft. of mud and salt water, plus 450 ft. of salt water.

Ohio Oil Co. last week reported the second dual completion, from both the "A" and "B" sands of Haynesville field, Claiborne Parish, since the deeper pay was discovered in 1946. Ohio's 1 L. L. Sherman, 3-H, 23-23n-8w, gaged 347 bbl. of 45°-gravity oil in 17½ hours, flowing through 11/16-in. choke, from the "A" zone. Perforations were at 10,021-061 ft. Flowing pressure was 2,000 psi., and gas-oil ratio was 807 cu. ft.

The "B" zone yielded 40 bbl. of oil through 15/16-in. choke. Gas-oil ratio was 9,556 cu. ft. According to report, at the time the B zone was tested, it had not cleaned itself, and operators were confident of much greater production.

In Arkansas, Robert W. O'Mears 1 T. F. Moody, prospective discovery in 12-16s-22w, Columbia County, was waiting on cement after squeezing perforations at 7,232-35 ft. in the Smackover. Drill-stem test from that interval had recovered 2,000 ft. of oil, along with considerable salt water.

ARKANSAS SUCCESSFUL WILDCAT
(Previous Completion)

Union County: G. H. Vaughn 1 Annie Smith, SE SE 8-16s-17w, pumped 72 bbl. 29.4°-gravity oil a day, perforations in Smackover 6,337-42 ft., TD 6,348 ft., elev. 169 ft.

ARKANSAS WILDCAT FAILURES
(Previous Completion)

Ouachita County: W. B. White & Jack Carnes 1 Rumph & Levy, NW SW SE 7-14s-18w, dry, TD 2,107 ft., Midway 764 ft., Nacatoch 1,322 ft., base Annona 1,831 ft., elev. 203 ft., spotted oil stain in core at 1,825-45 ft.

CANADIAN FIELDS

Leduc Gets Producer Despite Difficulties

CHATHAM.—The most spectacular completion in the Leduc field, Atlantic Oils 3, LSD 12, 23-50-26w4, in the northeastern sector, has been finished as a large producer. Location offsets Atlantic 1, a D-3 producer, to the south. Atlantic 3 topped the Devonian at 5,265 ft., the highly porous formation absorbing drilling mud to such an extent that lost circulation compelled a halt at 5,267 ft. Ordinary methods of restoring circulation proving ineffective, a procedure used in the Arabian fields was tried, drilling being resumed with drill-pipe loaded with water and the space between pipe and walls loaded with mud. The fluid was not circulated, and it was hoped the formation cuttings would be absorbed by the porous rock. Drilling was making headway at about 4 ft. an hour when suddenly the mud was blown from the hole and the well started flowing gas and oil. The kelly bushing was blown out of the rotary table and there was no chance to clamp down the blowout preventer. The gas flow started at around 15,000,000 cu. ft. a day, increasing to close to 50,000,000 cu. ft. with oil flow reaching 200 bbl. an hour flush. Oil and drilling mud formed a pool more than ½ mile in circumference before the flow was controlled.

An important development is successful completion of Imperial 9, LSD 16, 3-50-26w4, more than a mile south and east of the most southerly producer, as commercial in both the D-2 and D-3 zones. The completion brings at least two sections, 1,280 acres, into the potential producing area, and indicates a tortuous indentation of the coral reef barrier, a feature of the Leduc field. While Imperial 7 was productive in the D-3 zone, Imperial 34, ½ mile southwest, finished dry. In the subdivision immediately south, East Leduc-Brazeau 1 got production, indicating the barrier swings sharply to the west around Imperial 34. Imperial 9 is encouraging for still farther extension to the south.

In the main field, Imperial 38, LSD 3, 26-50-26w4, has been swabbed in at 5,338 ft. with initial flow of 273½ bbl. in a 7-hour open flow test. Imperial 37, LSD 5, 35-50-26w4, in drill-stem test at 4,634-4,715 ft., showed 75,000 cu. ft. gas, with 700 ft. of oil in the pipe, and is deepening below 4,949 ft. Imperial 40, LSD 11, 34-50-26w4, gave a 1,400-ft. rise of oil in the D-2 zone and is deepening from 5,207 ft. Imperial has two other wells testing, six drilling, two rigging up and one location. Independent companies have seven wells drilling, two rigging up and seven locations.

Wildcat tests.—In the north central plains, two areas where similar conditions to those in the Leduc field may be encountered, are being tested by Imperial Oil. Imperial-Volmer 1, LSD 2, 16-55-25w4, has rigged up 23 miles north of the Woodbend discovery and just south of the Morinville deep test drilled last year. Imperial-Tofield 1, LSD 9, 18-50-18w4, 44 miles east of Leduc and 35 miles northwest of the Viking-Kinsella gas field, is currently below 1,225 ft.

Turner Valley.—In the southern end of North Turner Valley, Royalite-Lowery 8, LSD 9, 10-20-3w5, finished with the Madison limestone at 8,390-8,630 ft., making about 100 bbl. daily on booster gas after light acid wash from the first porous zone. It has been acidized further, increasing production to around 400 bbl.

Blackfoot.—In the Blackfoot section of Lloydminster field, Imperial-H. B. Blackfoot 1 has been finished as a producer from the Sparky sand at about 50 bbl. Imperial will drill six additional wells in the same area, in 23-50-2w4, with Imperial 2 in SW 2, No. 3 in NE 1, and No. 4 in NE 2.

Dina.—Acreage of Highwood-Sarcee Oils in the Dina area, in eastern Alberta south of the Lloydminster field, will be undertaken this spring by United States interests. North Canadian Oils of New York City will develop 7,500 acres of Alberta crown leases and an additional 3,000 acres of C.P.R. rights, starting a drilling campaign early this spring. Anglo-American Petroleums, sponsored by California and Vancouver interests, has taken over 1,200 acres of C.P.R. rights, drilling to start April 15 with four wells each year.

Southern foothills.—On the Watson structure in the southern foothills, Maxmont-Lundbreck 1, LSD 10, 20-9-2w5, which has reached a record cable-tool depth for Canada of 9,916 ft., is continuing drilling. Seattle interests, represented by Miss V. P. Hunter, are financing the test. The same interests are drilling Demer-Lundbreck 1, LSD 16, 31-3-2w5, below 1,700 ft. Structural conditions are similar to those in the nearby Pincher Creek area, where Canadian Gulf-Pincher Creek 1, LSD 15, 24-3-29w4, bottoming in Madison limestone at 11,927 ft. encountered heavy wet gas flow, and is preparing to make a definite production test.

Saskatchewan.—A number of wildcat tests in Saskatchewan outside the Lloydminster field have recently been completed. Most promising results were in the Vera-Unity area, where Bata Petroleums 20, LSD 6, 22-39-23w3, got the Sparky sand at 2,004-19 ft. and Devonian limestone at 2,117 ft., with 2,830,000 cu. ft. of gas and some oil. The well is being placed on the pump for a definite production test. Bata 21, on the northwest edge of the field, failed to encounter oil or gas, and was abandoned at 2,141 ft.

OHIO, KENTUCKY

Muskingum County Well Produces From Two Sands

COLUMBUS.—The Preston Oil completed a two-sand producer on the R. A. Taylor Consolidation in Section 9, Salt Creek Township, Muskingum County. The Clinton sand, at 4,210-35 ft., was shot with 60 qt. and the Medina sand, at 4,303-10 ft., shot with 20 qt. The well then made 63 bbl. in 24 hours by flowing and swabbing.

The first offset to the South Penfield discovery came in at 2,290,000 cu. ft. gas natural. The well, ½ mile to the west, is located on R. D. Strong, Lot 23, Penfield Township, Lorain County. The Clinton sand was logged at 2,437-52 ft. Another offset to the south is now drilling.

Fierbaugh et al moved ¼ mile east of their discovery on Martin Clauser, Lot 24, Ruggles Township, Ashland County, and drilled in a better well on the same tract. The Clinton sand at 2,470-75 ft. showed 660,000 cu. ft. gas natural, and 1,160,000 cu. ft. when shut in after shot.

A 500,000 cu. ft. Berea sand gas well was completed by A. M. Cooper et al on W. E. Robinson in Section 32, Carthage Township, Athens County. The sand was topped at 1,680 ft. and drilling stopped at 1,687 ft. before the oil pay was reached. Another gas well was brought in for the Sego pool in Madison Township, Perry County. Oxford Oil 4 E. A. Moore, Section 22, found the Clinton at 3,290-3,368 ft., having 874,000 cu. ft. gas and a very small show of oil. The operator is undecided about shooting the well.

Eighteen locations were reported from 13 counties, Muskingum and Perry counties having three each and Lorain County two. Ashland and Lancaster fields led in completions with 5 each out of a total of 23.

OHIO SUCCESSFUL WILDCATS

Muskingum County, Blue Rock Township: Wasson Co. 1 Elmer Abele, Section 14, Clinton 4,385-4,416 ft., 3,500,000 cu. ft. gas, TD 4,416 ft.

WESTERN KENTUCKY

OWENSBORO.—The Sohio Petroleum Co. 4 D. H. Waltrip, 20-N-27, was completed in the Tar Springs sand at 1,657-92 ft. for an initial production of 110 bbl. per day. The well is located in McLean County.

Carter Oil Co. completed the 7 M. Drury, NE NW SE 1-O-20, Union County, in the McClosky at 2,576-79 ft., for an initial production of 105 bbl. per day. The well is in the St. Vincent pool and was drilled to 2,579 ft.

Sinclair Prairie Oil Co. has completed the 7 M. D. Chandler, NW SW NW 11-N-23, Poole East in Webster County, for an initial production of 30 bbl. per day. The well was completed in the Benoist at 2,374-83 ft. and total depth was 2,387 ft.

Two new wildcat locations were reported for the week. Sun Oil Co. has staked the 1 Lillie Binford, 23-O-19 in Union County, and the other location is the C. B. Small, Jr., 1 F. Ramsey, 11-I-22 in Hopkins County.

EASTERN KENTUCKY

ASHLAND.—For the second consecutive week a survey of operations in Eastern Kentucky field disclosed there were no completions.

INDIANA

EVANSVILLE.—The H. L. Cokes, George & Wrather, and Aurora Gasoline Co. 1 William Heneisen, SW SW E½ NW 19-5s-11w, Vanderburgh County wildcat, has flowed at the rate of 30 bbl. per hour but has shut down for tank space. Production is from the Aux Vases at 2,620-25 ft. Total depth was 2,775 ft. plugged back to 2,669 ft.

The Gibson County wildcat, Superior Oil Co. 1 Levi Tucker, NW NW SW 4-3s-11w,

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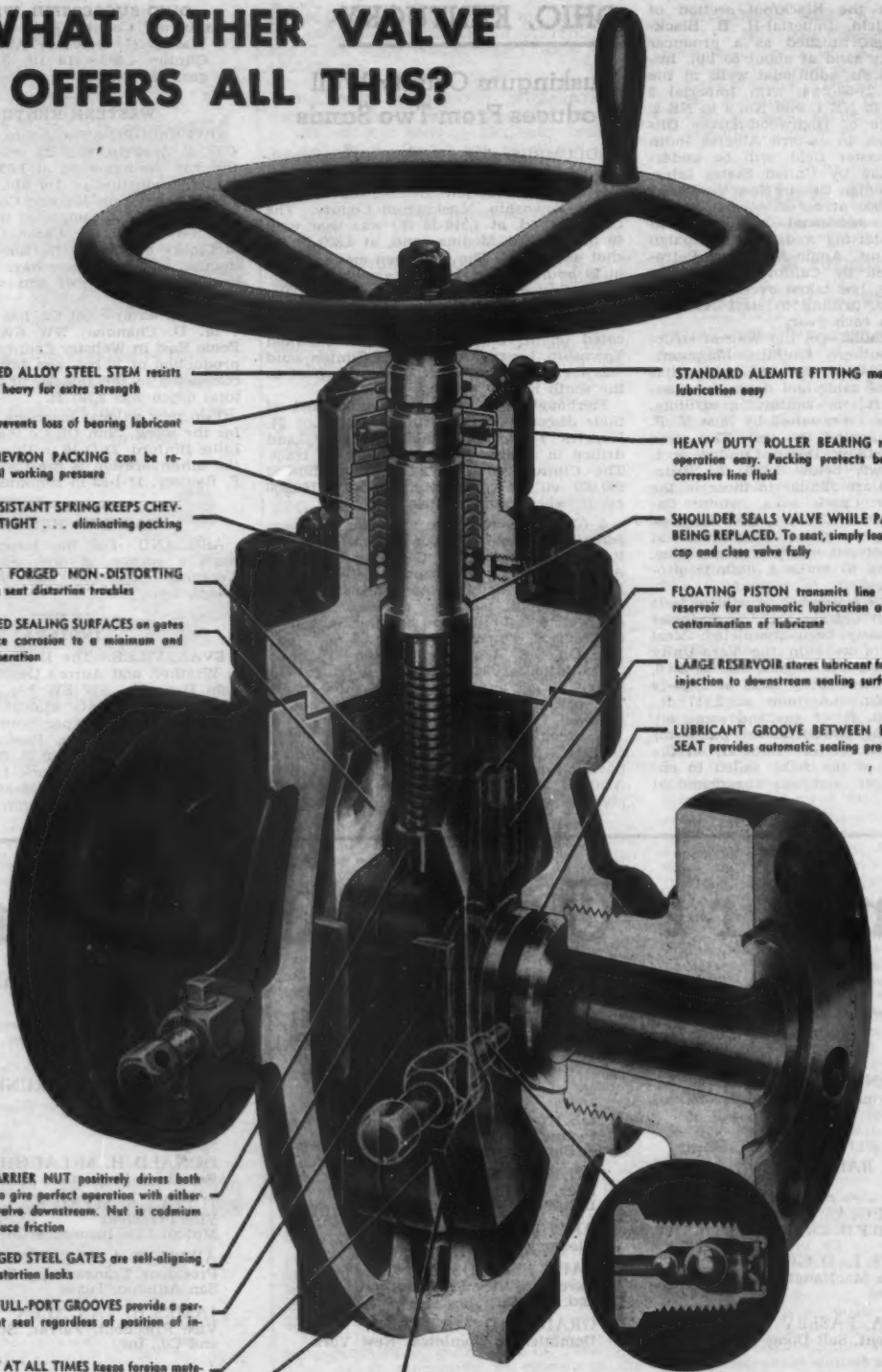

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has been completed in the Benoist at 2,223-34 ft. with an initial production of 5 bbl. of oil and 15 bbl. of water per day. Total depth was 2,525 ft. for a test of the McClosky and plugged back to 2,240 ft.

Posey County had two good completions in 24-5s-14w. The Sells Petroleum Co., Inc., 5 "C" Hickman & Elliott was completed in the Palestine at 1,967-76 ft. for an initial of 100 bbl. per day and the Superior Oil Co. 12 Morton Elliott was completed at 2,935-40 ft. in the McClosky for 100 bbl daily.

Majors Oppose Mexican Development, Jones Says

(Continued from page 75)

mates were upped production would increase were voiced by Wherry during his examination of Alfred G. White, bureau statistician who prepares them.

Wherry told White frankly that he believed if the bureau raised its production recommendations that states would follow with increased allowables which would permit the production of enough crude to meet all consumptive demand.

White, in explaining the forecasts, disclosed they are no longer estimates of consumer demand but evaluations of possible output by the industry, since they take into consideration such factors as transportation and refinery capacity and are not based upon any estimate of what could be marketed if produced.

The colloquy got into the field of the possible effect of the forecasts on price, bringing from Sen. James E. Murray of Montana, who sat in on the hearing for a while, the suggestion there is some influence in the department to keep prices up which should be investigated.

Wherry disclosed that he had received an answer to his letter to President Truman, asking suspension of the Connally Act. He did not reveal the President's decision, but there were indications in other quarters that his suggestion had been rejected, probably on the ground that such action would not of itself result in any increase in legal production.

States to Be Cautious

This view also was taken by NPC Chairman Walter S. Hallanan in a letter to Wherry in which he pointed out the President has no authority to suspend the state conservation laws and said he saw no probability that the states would permit themselves to be pressured into raising allocations above what they consider maximum efficient rates.

Accordingly, Hallanan said, production would not legally be increased by the proposed suspension, but in one or two fields there might be a temporary increase in daily rate at the expense of ultimate yield.

"I refer especially to East Texas field," he said. "It has been necessary to appropriate a substantial amount each year for the administration of the hot-oil law and East Texas has throughout been the principal area of its operation.

"From time to time, violations are detected and punishment imposed by the court. The presence in the field is thus indicated of operators who would be willing to despoil a great field for their temporary personal gain."

Hallanan denied that the Connally Act has been used to influence prices, and said its suspension "would be an invitation by the President to loot and despoil."

"The producers and others in the industry through experience have learned that production in accordance with sound technical principles means the ultimate production of billions of barrels of oil which otherwise would be left in the ground," he continued. "Only a fractional percentage shall operate in any other manner.

"I am one of the supporters and advocates of conservation practices. . . . Should there be a suspension of this law, I would immediately urge the states to put a man on every lease in every field where violations might be expected and make certain that the career of ruin did not get started."

S.C.M.A. Meeting Will Stress Electronics

The field of electronics will be featured in the discussions of the Southern California Meter Association meeting, April 15, 1948, at the Rio Hondo Country Club.

"Elementary Principles of Electronics," will be presented by Howard Belmont, of the engineering division of General Electric Co., and "Applications of Electronic Instruments," by G. F. Rucker, field engineer in the technical division of Leeds & Northrup Co.

Butcher-Arthur Accepts First of New Barges

HOUSTON.—Butcher-Arthur, Inc., this week took delivery of the first unit in its $3,500,000 program of new oil barge equipment.

Delivery was made in St. Louis by the St. Louis Shipbuilding Co. of the first of six river towboats and the first two of 16 oil barges on order. Additional units are to be delivered at 6-week intervals. In addition, Butcher-Arthur has four other identical barges scheduled for delivery later this year by Dravo Corp. in Pittsburgh.

In ton-miles, the new equipment will approximately triple the company's carrying capacity and will allow the delivery of about 500,000 bbl. of products monthly to St. Louis from the Houston area. The new barges, each with a capacity of 20,000 bbl., fit together at their abutting ends to form a rigid two-barge unit. The river towboats will be equipped with radar and other navigational aids.

Seaside Oil Observes Fiftieth Anniversary

Seaside Oil Co., which was established in 1898 and operated in the shoreline oil field at Summerland, Calif., south of Santa Barbara, this year is celebrating its fiftieth anniversary as an operating company.

The company's original refinery at Summerland was one of the first in the state. In 1923 the company built its refinery at Ventura for the manufacture of gasoline and a complete line of petroleum products. Prior to that it was concerned primarily with the refining and selling of heavy distillates, fuel oil and asphalt.

Industry Agreement Deadline Is Nearing

WASHINGTON. — With a requirement by the Department of Justice that the oil industry's temporary voluntary agreement under the Taft anti-inflation act will expire April 1 unless a permanent agreement is earlier adopted, it appeared this week that it will be necessary to do a great deal of work in the last few days of this month if a long-term agreement is to be perfected before the deadline date.

Questioned by reporters regarding the progress made on the agreement, Interior Secretary J. A. Krug said last week the committee to draft it has not yet been set up and that, after it is organized, it will be at least 2 weeks before a public hearing, required under the act, can be called.

Russia Refuses Offer For Austrian Oil Output

America's compromise suggestion to Russia that would give Russia 53 per cent of Austrian oil production as reparations has been turned down by the Soviet. Russia claims two-thirds of Austria's oil production. Britain and the United States previously had suggested 40 per cent as fair settlement.

Lecture Course Begun

HOUSTON.—Dr. Richard T. Arnold, professor of organic chemistry at the University of Minnesota, this week began a 2-week lecture course for technical and research personnel at Humble Oil & Refining Co.'s refinery in Baytown. Arnold's discussions are the tenth of a series being conducted by Humble. Arnold's subject is "Special Topics in Organic Chemistry."

STATISTICS and

WEEKLY WELL COMPLETIONS . . . WEEK ENDED MARCH 13, 1948

	Total of all wells					Cum.		Wildcat completions and discoveries					Cumulative total, 1948				
	Comp.	Oil	Gas	Dry	Footage	1948	1947	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	27	13	0	*14	30,007	317	291	0	0	0	0	0	0	0	0	0	0
Pennsylvania	49	20	9	†20	90,105	589	675	0	0	1	0	1	0	0	3	10	13
West Virginia	9	3	2	4	29,164	143	177	2	0	0	1	3	2	0	11	16	29
Ohio	25	7	11	‡7	65,264	225	240	0	0	1	0	1	1	0	3	7	11
Indiana	8	5	1	2	12,635	184	89	0	0	0	0	0	1	0	0	2	3
Kentucky	10	4	0	6	16,181	128	80	0	0	0	0	0	1	0	0	3	4
Illinois	33	22	0	11	88,650	414	395	2	0	0	3	5	10	0	0	67	77
Michigan	9	1	1	7	20,636	142	125	0	0	1	5	6	5	0	4	57	66
Kansas	53	32	6	15	165,746	567	533	1	0	0	3	4	8	0	1	65	74
Neb., Mo., Iowa	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
Oklahoma	69	43	3	23	285,009	748	839	2	2	0	10	14	25	3	6	127	161
Texas	184	103	8	73	851,994	2,052	1,642	7	0	5	41	53	66	5	20	388	479
North Central (Dist. 7-B & 9)	55	29	1	25	166,388	611	505	2	0	1	11	14	26	0	4	123	153
West (Dist. 7-C & 8)	58	39	1	18	272,883	549	413	1	0	1	8	10	10	0	1	40	51
Panhandle (Dist. 10)	2	2	0	0	5,876	106	92	0	0	0	0	0	0	0	1	2	3
Eastern (Dist. 5 & 6)	7	2	1	4	42,536	110	95	0	0	0	2	2	3	0	0	32	35
Gulf Coast (Dist. 2 & 3)	33	14	2	17	215,418	341	313	2	0	1	13	16	18	4	4	92	118
Southwest (Dist. 1 & 4)	29	17	3	9	148,893	335	224	2	0	2	7	11	9	1	10	99	119
Louisiana	32	22	1	9	200,766	361	227	0	1	0	2	3	7	4	1	32	44
Northern	17	14	1	2	47,067	232	106	0	0	0	0	0	0	0	0	17	17
Southern	15	8	0	7	153,699	129	121	0	1	0	2	3	7	4	1	15	27
Arkansas	6	3	0	3	24,940	73	42	1	0	0	1	2	2	0	0	19	21
Mississippi	11	6	1	4	88,382	86	71	0	0	0	3	3	2	0	0	17	19
Southeastern States	0	0	0	0	0	7	11	0	0	0	0	0	0	0	0	6	6
Montana	5	4	0	1	13,208	52	36	0	0	0	0	0	1	0	0	7	8
Wyoming	7	7	0	0	32,118	76	48	2	0	0	0	2	5	0	0	7	12
Colorado-Utah	5	5	0	0	31,968	58	31	0	0	0	0	0	0	0	0	9	9
New Mexico	18	13	1	4	86,086	125	100	0	1	0	2	3	2	1	0	6	9
California	51	48	1	2	168,760	547	416	0	0	0	2	2	5	0	0	54	59
Total United States	611	361	45	205	2,301,619	6,894	6,070	17	4	8	73	102	143	13	49	899	1,104
Total previous week	591	355	38	198	2,016,209	6,283	5,522	11	1	2	69	83	126	9	41	816	1,002
Total March 15, 1947	548	312	55	181	1,973,676			13	4	4	59	80	122	17	29	763	931

Service wells included: *14, †20, ‡2.

CRUDE PRICES AND REFINERY ACTIVITY

GRAVITY SCHEDULES

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

Gravity—	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$2.17	....	....	....
19-19.9	2.19	....	....	....
20-20.9	2.21	$2.25	....	$2.12
21-21.9	2.23	2.27	....	2.14
22-22.9	2.27	2.29	....	2.16
23-23.9	2.30	2.31	....	2.18
24-24.9	2.34	2.33	$2.56	2.20
25-25.9	2.38	2.35	2.58	2.22
26-26.9	2.41	2.37	2.60	2.24
27-27.9	2.45	2.39	2.62	2.26
28-28.9	2.49	2.41	2.64	2.28
29-29.9	2.52	2.43	2.66	2.30
30-30.9	2.56	2.45	2.68	2.32
31-31.9	2.59	2.47	2.70	2.34
32-32.9	2.62	2.49	2.72	2.36
33-33.9	....	2.51	2.74	2.38
34-34.9	....	2.53	2.76	2.40
35-35.9	....	2.55	2.78	2.42
36-36.9	....	2.57	2.80	2.44
37-37.9	....	2.59	2.82	2.46
38-38.9	....	2.61	2.84	2.48
39-39.9	....	2.63	2.86	2.50
40 and above	....	2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point. †Includes Lea County, New Mexico.

A.P.I. REFINERY REPORT, WEEK ENDED MARCH 6

(Thousands of barrels)

District—	Crude runs, daily avg.	Production: Gasoline†	Kerosine	Gas & dist. oil	Residual	Stocks at refineries, bulk terminals, in transit and in pipe lines: Gasoline*	Kerosine	Gas & dist. oil	Residual
East Coast	861	1,912	469	1,321	1,848	22,503	3,515	7,435	7,000
Appalachian:									
District 1	98	264	61	93	94	2,143	170	361	289
District 2	66	219	33	79	108	1,161	106	220	110
Ind., Ill., Ky.	836	2,706	468	1,063	1,093	20,696	1,649	3,964	3,471
Okla., Kans., Mo.	444	1,446	209	570	526	10,770	511	1,870	1,406
Inland Texas	231	964	89	192	389	4,247	229	305	832
Texas Gulf Coast	1,335	3,727	900	2,270	1,694	20,725	1,508	4,767	5,572
La. Gulf Coast	427	1,232	406	604	559	5,770	806	1,816	1,766
N. La. and Ark.	78	195	62	91	716	2,263	302	315	199
Rocky Mountain:									
New Mexico	11	30	4	10	23	115	25	19	30
Other Rocky Mtn.	143	414	27	184	291	3,129	102	659	722
California	781	2,342	93	877	1,959	17,952	920	11,018	26,717
March 6, 1948	5,311	15,451	2,821	7,354	8,700	111,474	9,843	32,749	48,114
February 28, 1948	5,463	15,796	2,780	7,963	8,824	111,040	9,594	33,836	49,206
March 8, 1947	4,874	14,671	2,259	5,477	8,406	104,358	10,788	35,492	43,491

*Finished and unfinished. †At refineries including natural blended.

Bureau of Mines crude-oil stocks 219,575,000 bbl. as of March 6—down 932,000 bbl. One year ago 223,679,000 bbl.

FLAT CRUDE PRICES

Representative posted schedules per bbl.

East Texas	$2.65
Kettleman Hills, California*	2.14
Beauregard Parish	2.60
Illinois Basin	2.77
Pecos County, Texas (Yates)	2.35
Bradford, Pennsylvania	5.00
Eastern Ill. and Western Ind.†	2.77
Tomball, Texas Gulf Coast	2.83

*37°-37.9°. †35° and above.

TRENDS

DAILY AVERAGE PRODUCTION FOR WEEK

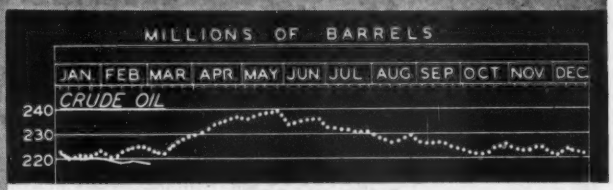
	Mar. 13 crude oil	B. of M. Mar. demand	Mar. 6 crude oil
Alabama	1,400	1,500	1,300
Arkansas	87,450	83,000	86,750
California	933,900	930,000	934,600
Colorado	45,980	48,000	46,470
Eastern	62,950	64,900	66,250
Florida	825	1,000	775
Illinois	167,500	180,000	174,000
Indiana	16,900	16,000	18,300
Kansas	199,300	304,000	291,450
Kentucky	25,100	26,000	26,300
Louisiana	476,100	474,000	476,550
North Louisiana	122,450	.....	122,900
South Louisiana	353,650	.....	353,650
Michigan	45,900	46,000	44,750
Mississippi	112,460	116,000	113,910
Montana	24,730	24,000	22,910
Nebraska	400	600	500
New Mexico	128,950	128,000	128,950
Oklahoma	407,100	410,000	409,100
Texas	2,400,675	2,400,000	2,400,675
Dist. 1 (Southwest)	25,475	.....	25,475
Dist. 2 (Southwest)	170,350	.....	170,350
Dist. 4 (Southwest)	253,200	.....	253,200
Dist. 3 (Gulf Coast)	491,350	.....	491,350
Dist. 5 (Eastern)	43,350	.....	43,350
Dist. 6 (Eastern)	121,225	.....	121,225
East Texas Field	323,000	.....	323,000
Dist. 7-C (West)	43,850	.....	43,850
Dist. 8 (West)	666,700	.....	666,700
Dist. 7-B (W. Central)	43,100	.....	43,100
Dist. 9 (N. Central)	135,675	.....	135,675
Dist. 10 (Panhandle)	83,400	.....	83,400
Wyoming	138,010	137,000	136,080
Total United States	*5,275,630	5,390,000	5,379,620
Change fr. prev. wk., dn.	103,990		

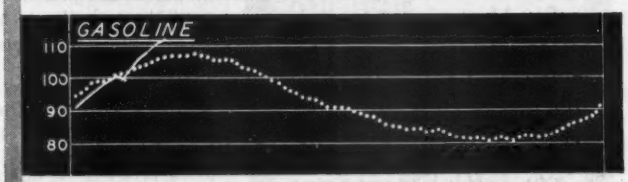
Total production January 1-March 13..... †394,417,695 bbl.
Same period last year (crude plus cond.).. 342,629,015 bbl.

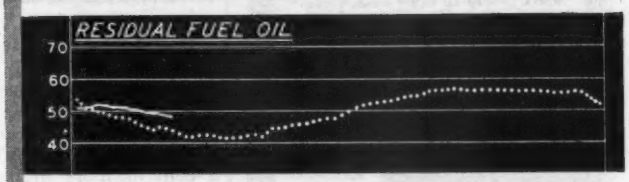
*Not incl. 52,270 bbl. condensate. †Incl. 3,662,195 bbl. condensate.

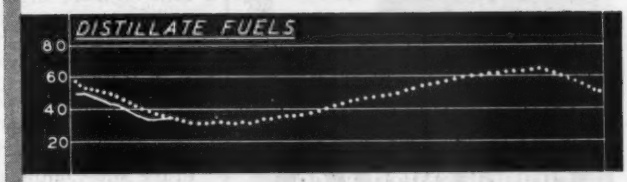
STOCKS IN UNITED STATES

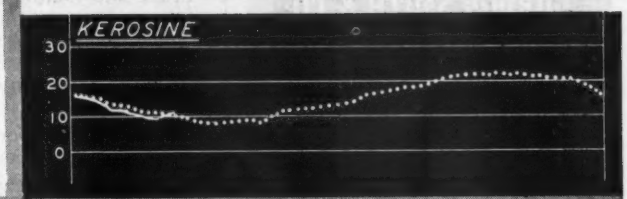
---- 1947 ——— 1948



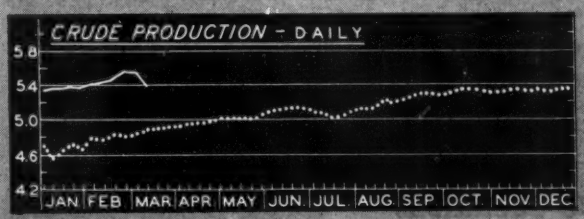




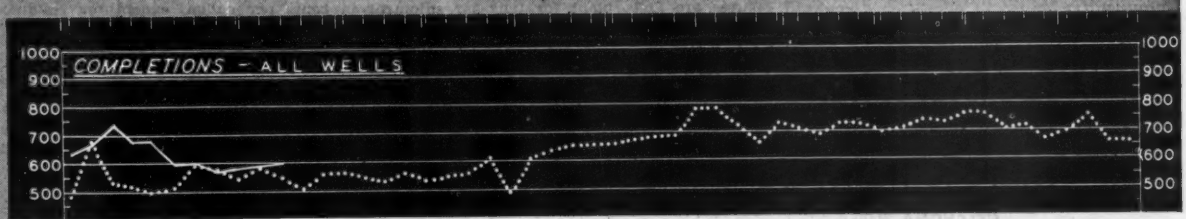


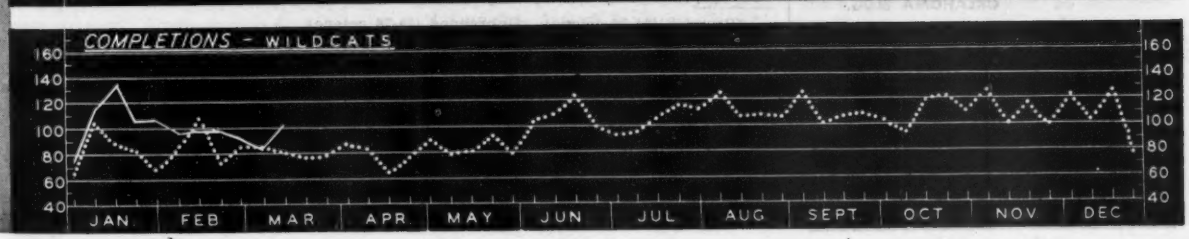


---- 1947 **DAILY OPERATIONS** ——— 1948



---- 1947 **WEEKLY COMPLETIONS** ——— 1948





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KEEP YOUR EYE ON KEROTEST
BIG NEWS COMING!
KEROTEST

MARKETS

IN the Gulf Coast area the market in petroleum products continued to show weakness in spot trading last week. Publication and contract prices remained unchanged, but independent marketers reported further drops in the bonus prices which have been paid through the winter.

One marketer said the so-called premiums are off as much as a full cent on burning oils. Distributors, he said, are no longer desperate enough for supplies to pay premium prices, and apparently see sufficient storage to carry them through any remaining cold weather.

One source reported selling No. 2 at 11½ cents with an East Texas refinery as the source of the material. Sales of housebrand motor fuel at 11½ cents also were reported. A few weeks ago this price level ranged 1 cent or more higher. The weakest position was shown by No. 6 industrial fuel oil which at prices ranging from $2.75 to $3 was off considerably from the $3.50 top reported several weeks ago. No. 6 was also soft for movement by water with material being offered at $3.20.

In the Mid-Continent area last week the marketing situation was reported to have been little affected by the severe and widespread cold wave that enveloped practically all the Mid-Continent states.

One supplier reported that No. 2 burning fuel could be obtained "without much trouble" at 12 cents or a little under. The recent severe weather brought out only "a few more inquiries" than before, he said.

No. 6 Shows Drop

A drop of 10 to 20 cents per barrel in No. 6 residual oil was noted by one marketer over the past week and he was of the opinion that a "further decline" may be expected. Another source reported that while he expected a slight dropping off of demand for No. 6 saw no evidence of it yet. He predicted that several refiners would probably turn to producing more asphalt in place of No. 6 fuel oil but that the market for available No. 6 would remain active.

The general tank-car scarcity was somewhat aggravated over the past week because of the heavy snowfall in several areas which was responsible for slowing up tank-car movements. But a general easing up of the situation accompanied the mild weather early this week.

Kerosine demand in the Mid-Continent area remained extremely strong. One observer indicated that there would be no appreciable decline in this product because of the expected strong demand from agricultural sources.

No price changes were reported in natural gasoline movements. Demand continued strong.

East Coast Unchanged

On the East Coast no change in price levels was evident. Demand continued strong and supply of all refined products remained tight. Suppliers reported no easing in the availability of kerosine and No. 2 fuel oil. East Coast distillate oil stocks, which the District 1 Petroleum Regional Advisory Committee has termed "dangerously low," rose for the first time in almost 4 months during the week ended February 28.

Most sources were agreed that the heating season pressure of demand was off now, but that the problem of meeting the needs of the approaching motor fuel season was already coming to the forefront.

Representative Quotations

Representative spot-market quotations of leading suppliers as of March 15, 1948. Figures are f.o.b. plant for tank-car shipment in cents per gallon, except for residua. fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor	Texas Gulf Coast
Regular gasoline, 73-75 octane	10½-11½	11.6-12* 10.5-12.2†	10.9-12
Premium gasoline, 78-80 octane	11¾-12½	10.6-13.4	12.9-13
42-44 w.w. kerosine	10-10½	10.2-12.2	10¼-12
No. 2 straw fuel oil	9¼-11	9.3-11.1	9.05-11½
No. 6 residual	$2.50-3.00	$3.03-3.90	$2.56-3.00

*Branded (74-76 octane); †Unbranded (74-76 octane).

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	8½	8	8¼
Grade 18-55	10.2	9.8	9.9

LUBRICATING OILS
South Texas

200 vis., No. 2-3 neutral	13-14.5
750 vis., No. 3-4 neutral	15-17.25
2,000 No. 5-6 neutral	17-18½

LUBRICATING OILS
Mid-Continent

150-160 vis., D bright stock, 0-10 pp.	30-32
200 vis. No. 3 neutral, 0-10 pp.	20-21

Western Pennsylvania

145-155 vis. 10 p.t. br ght stock	47
180 vis. p.t. neutral	45

CRUDE-SCALE WAX
Mid-Continent

130-132 A.S.T.M. melting point	8½-8¾

EQUIPMENT MEN ... in the News

Penberthy Has New General Sales Manager

F. E. RUEBELMANN

Since the Penberty Injector Co., became a subsidiary of Buffalo Bolt Co., the products, policies, and personnel have continued unchanged with only one important exception in personnel. Fred E. Ruebelmann was appointed general sales manager to succeed A. D. Thomas who resigned. Ruebelmann has been a member of the Penberthy organization for more than 36 years—most recently as supervisor of sales.

Brainard and Eikrem Elevated

Fay Brainard has assumed the newly created position of special assistant to Eugene Caldwell, general manager of the Hyster Co., Portland, Ore.

Brainard's new duties will be expediting projects in methods, inventory control, and similar fields. He has been plant engineer of the Portland plant since joining Hyster in 1942. He received his mechanical engineering degree from Oregon State College in 1941.

Svante Eikrem will assume the plant engineer position. He also received his mechanical engineering degree from Oregon State College in 1941. Since joining the company in 1943 he has worked on assembly-line layout and on tool design in the Portland plant.

New Corporation Formed

Petroleum Engineering Corp. is the formal name of the newly formed organization which will assume all work formerly handled by Petroleum Engineering Industries, Inc., 122 South Michigan Avenue, Chicago. Walter Headden Ogden, former general manager of the original company, has been named president and general manager of the new corporation. The main office address will remain the same.

In line with previous operations, Petroleum Engineering Corp., will continue to offer complete specialized engineering and construction facilities for the planning and erection of all types of bulk and standby liquefied-petroleum plants for industrial and public-utility service, including all necessary plant equipment.

The company will also offer an entirely new service, to provide industry with what is said to be a more rapid and accurate method of electronic thickness measurement. This service will be available for testing all types of steel tanks and equipment, both above and below ground, to determine its condition.

Biggs Named First Vice President

Fred P. Biggs has been appointed first vice president of Brake Shoe & Castings Division of American Brake Shoe Co.

Biggs has been with Brake Shoe since 1916. In addition to his new duties, he will continue as vice president in charge of sales of the Brake Shoe & Castings and Southern Wheel Divisions, positions which he has held since 1944.

Porter Opens Houston Office

H. K. Porter Co., Inc., Pittsburgh, has appointed William Lee, district manager of its new Houston sales office. Lee has been associated with the oil industry for the past 13 years, serving in both sales and service capacity. He will handle the complete line of Porter equipment for the processing and refining industries and also the oil-field specialties manufactured by Hinderliter Tool Co. Division of H. K. Porter Co., Inc., whose plant is located at Tulsa.

The Houston office will be located at 1045 Electric Building.

Templeton to South America

Knight C. Templeton, associated with Roland E. Smith, export representative for Abegg & Reinhold Co., Atlas Production Inc., B & W, Inc., Fullerton Manufacturing Co., Globe Oil Tools Co., and Medearis Oil Well Supply Co., recently departed for an extended visit to the oil fields of Peru, Ecuador, Colombia, Venezuela, Trinidad, and Mexico.

Templeton plans to return to the United States the latter part of May.

Ledeen Joins Engineering Products

Howard Ledeen has been appointed to head all sales of Ledeen heavy-duty cylinders for Engineering Products Co., Los Angeles. Being particularly close to the original development and design of these actuating cylinders, Ledeen is to place emphasis on special engineering developments as well as sales.

Burke Joins G.M. Overseas Operations

Edmund Burke, Jr., petroleum and chemical engineer, has joined the staff of General Motors Overseas Operations. Burke will be responsible for the sale of General Motors Series 71 diesel oil-field engines to foreign accounts in the New York area. His long experience in the oil business provides him with an exceptionally fine background for this assignment.

Burke resides in White Plains, N. Y., and will operate from the General Motors Overseas Operations offices in New York City.

I.T.& T. Consolidates Manufacturing Activities

International Telephone & Telegraph Corp. announces that consolidation of its manufacturing activities through acquisition of International Standard Electric Corp., New York, by Federal Telephone & Radio Corp., Clifton, N. J., has been approved by the board of directors. Both companies are I.T.& T. subsidiaries. Through the acquisition of stock of I.S.E., Federal will control the major manufacturing subsidiaries of the I.T.T. system throughout the world, including more than 30 plants in 24 different countries.

Four appointments were also announced. Fred T. Caldwell, president of International Standard Electric and vice president and director of I.T.& T., has been elected president of Federal. Rear Adm. Ellery W. Stone, USNR, formerly chief commissioner of the Allied Control Commission in Italy, and a vice president of I.T.& T., has

been elected executive vice president of Federal. R. C. Blackinton has been elected vice president of Federal, in charge of production. Mark A. Sunstrom, vice president of I.T.& T., has been elected executive vice president of International Standard Electric Corp.

Cordes Assumes Advertising Duties

Wilmer H. Cordes, manager market-development division of American Steel & Wire Co., has assumed the added duties of manager of the advertising division of that United States Steel subsidiary.

Cordes this year will celebrate his thirty-fifth anniversary with American Steel & Wire, having first been employed as a messenger in the mailing department at Chicago in August 1913. Within 3 months he was transferred to the advertising department and worked his way up through the ranks, being appointed manager of advertising in December 1928. He subsequently held a number of other positions before being named manager, market-development division in January 1947.

Meyer Named Sales Manager

Nicholas E. Meyer has been appointed manager of sales for Oil Well Supply Co.'s Wilson-Snyder Division.

Meyer, whose headquarters will be at Braddock, Pa., replaces Howard W. Booth, transferred to Oilwell's export division.

Meyer attended Carnegie Institute of Technology 5 years. He has served continuously with Wilson-Snyder Division since joining Oil Well Supply Co. in 1928, headquartering at Braddock and New York City.

Export Sales Appointments

G. M. WATTERS

Appointments of V. Z. Pavlenko, G. M. Watters, and C. P. Brooks as field engineers for the export sales department have been announced by Caterpillar Tractor Co. Pavlenko will headquarter in Sydney, Australia, working with E. R. Hotaling, district representative covering Australia, New Zealand, New Caledonia, British New Guinea, and Fiji Islands; Watters will operate from Caracas, Venezuela, with Robert B. Campbell, district representative; Brooks will assist F. L. Peterson with headquarters in Johannesburg, Transvaal, South Africa.

Thielen and Rosenstein Added to Staff

Frank Thielen, Jr., and T. W. Rosenstein are now members of the Houston sales department of L-K Pump Valve Co., Houston.

A native Houstonian, Thielen was formerly assistant purchasing agent of Emsco Derrick & Equipment Co. He was with Emsco for 11 years with the exception of a 3½-year period when he served with the U. S. Marine Corps in the South Pacific.

Thielen left Emsco in March 1946 to accept a position in the purchasing department of Diamond Alkali Co., prior to joining L-K.

Rosenstein, a native Texan, was in the Marine Corps for 4 years, including 2 years of duty in the Alaskan area. He was formerly a buyer in the purchasing department of Emsco Derrick & Equipment Co., where he worked for 2½ years. Both Thielen and Rosenstein will represent L-K Pump Valve Co. in the Houston area.

Batchelder and Old Promoted

Roger W. Batchelder has been appointed assistant to the president of National Bearing Division of American Brake Shoe Co., and William H. Old has been appointed general purchasing agent for American Brake Shoe.

Batchelder, formerly general purchasing agent for the company, has been with Brake Shoe since 1933. A native of North Reading, Mass., he attended Phillips Academy and Yale University. During the past year he has served as commanding officer of the 206th Air Service Group of the New York Air National Guard. In his new position he will be located at the division headquarters in St. Louis.

Old, formerly assistant general purchasing agent, has served in various purchasing capacities since he first joined the company in 1940. A native of Norfolk, Va., he is a graduate of Virginia Military Institute and also attended Harvard Graduate School of Business Administration. He will continue to be located in New York.

Simons Made Heil Sales Manager

Heil Co., Milwaukee, announces the appointment of William E. Simons as general sales manager. Simons has been sales manager of the truck body and hoist division of the company for several years and now heads all six sales divisions.

Other executive appointments include: Harry F. Pugh, vice president in charge of sales and advertising; Arnold F. Meyer, vice president in charge of engineering; Joseph J. Rosecky, vice president in charge of manufacturing; J. F. Horn, controller, assistant secretary and assistant treasurer; Earl C. Gilmore, assistant treasurer; Allan E. Magee, assistant secretary of Heil Co. and secretary of Arnold Dryer Co.; and Ed Fellows, Jr., director of purchases.

Hoffman Heads Michigan Store

C. Byron Hoffman has been appointed manager of the Grandville, Mich., store of Oil Well Supply Co.

Hoffman joined Oilwell in November 1935. He served as store man and later manager of the Muskegon, Mich., store and for 4 years was a field auditor with the accounting department, working out of Dallas, where the company's headquarters are located.

MacDonald Named Vice President

George R. MacDonald has been named vice president in charge of finance of Motorola Inc., radio and television manufacturing company. MacDonald, who joined Motorola as an accountant in 1934, has been treasurer of the company since 1942. He will continue his activities as treasurer of the company in addition to his new duties.

Personnel Changes in Wagner Electric

Wagner Electric Corp., St. Louis, announces the transfer of Fred Pasher from the position of manager of its Cleveland branch to that of manager of the Dallas branch, replacing the late B. B. Pierce, who died last month. Pasher has been manager of the Cleveland branch for 3 years. Previous to that, he had been manager of the Boston branch from 1927 to 1945.

Elmer Gent, Wagner automotive salesman in the Pittsburgh area, was appointed to replace Pasher as manager of the Cleveland branch. Gent has been with the Wagner company since 1936.

Oil Well Shifts Nabb

John W. Nabb has been appointed manager of the Oil Well Supply Co. store at Mirando City, Tex. Nabb, who served with the U. S. Marine Corps in World War II, joined Oilwell in January 1946 as storeman in the company's Alice, Tex., store, the position he leaves for the new appointment.

Keating Promoted By A. O. Smith

L. M. KEATING

L. M. Keating, assistant to the president in charge of distribution of A. O. Smith Corp., has been appointed executive administrator of the company's Southwest district office in Houston. Keating replaces B. F. Bart, who died recently.

Prior to joining A. O. Smith in 1936, Keating's interest in engineering, marketing, and administration brought him prominent indentification in a variety of fields. These activities included sales administration of technical products and jobbing. Keating's first assignment with A. O. Smith was to inaugurate a program of product diversification. During the war he supervised the design and construction of the company's Houston electrode plant, which has since been converted to the manufacture of liquid gas systems, pressure vessels, and vertical turbine pumps. For the past 3 years, he has served as executive in charge of distribution on the company's management staff.

In Houston, Keating will be in charge of all of the company's interests in Texas, Missouri, Louisiana, Oklahoma, Mississippi, Arkansas, Kansas, Colorado, and New Mexico, and will supervise branch offices in Dallas, Midland, Tulsa, and New Orleans.

Lane-Wells Announces Personnel Changes

In order to handle more efficiently the increased volume of business, Lane-Wells Co. has made the following changes and reassignments in field personnel.

R. B. Downing has been appointed Mid-Continent division manager following the resignation of R. B. McCullar.

C. L. Kirkman, formerly assistant district superintendent at Great Bend, Kans., succeeds Downing as division sales manager in Oklahoma City. R. H. Waggoner, formerly sub-district superintendent in Russell, Kans., has been transferred to Great Bend to succeed Kirkman; and A. N. Downing, former gun perforator operator in Russell, has been made subdistrict superintendent.

L. V. Steffey, formerly assistant district superintendent in Oklahoma City, has been transferred to Salem, Ill., as district superintendent, succeeding R. G. Echols, resigned. E. C. Doane, formerly subdistrict superintendent at Seminole, Okla., has been appointed to Steffey's former position; and Sidney R. Pittman, formerly an operator in Healdton, Okla., has succeeded Doane.

Other recent changes include the advancement of J. D. Dunigan from subdistrict superintendent at Guymon, Okla., to district superintendent at the same point, and the transfer of Ray Edwards, formerly operator in charge at the Ulysses truck station, to subdistrict superintendent of the recently established Garden City, Kans., subdistrict.

In the Gulf Coast division, E. A. Radack, formerly subdistrict superintendent at Laurel, Miss., has been moved to Shreveport, La., as assistant district superintendent. J. C. Strickland, formerly operator in charge of the Opelousas, La., truck station, has replaced Radack; and J. C. Orr has replaced Strickland. Leon Pyle has been made operator in charge of the new Monroe, La., truck station. E. F. Stokes has been made operator in charge of the new Lubbock, Tex., truck station.

Moser Named Chicago Sales Manager

William G. Moser has been appointed sales manager of the Chicago division of Smith Meter Co. With Smith Meter since 1938, Moser started in their sales-service department in Chicago. His most recent position was assistant sales manager, New York division.

Wood to South America

Carroll W. (Woody) Wood, export representative of Howard Smith Co., Brown Oil Tools, Inc., and Acme Well Supply Co., left recently for an extended sales trip through South America for these three firms. Wood will spend several months in South America visiting the Maracaibo district, Eastern Venezuela, and Trinidad and Colombia. In addition to the sales activities for these three organizations Wood will encourage South Americans to attend the International Oil Exposition in Tulsa, May 15-22.

Wood has been with Howard Smith Co. since 1937 with the exception of 2 years overseas service with the Sea Bees. Prior to joining Howard Smith Co., Wood spent 12 years with Shell Oil Co., Inc., in Mexico and Louisiana.

National Foam Names Hundt and Hughes

National Foam System, Inc., Philadelphia, announces that Rear Adm. L. T. Hundt, USN (retired) has been named general manager of the company's manufacturing plant at West Chester, Pa. E. P. (Pat) Hughes has been named assistant to the president of National Foam, fire-protection-equipment and foam-manufacturing concern.

Grant Rejoins Stewart & Stevenson

A. B. (Dick) Grant has rejoined Stewart & Stevenson Services, Inc., Houston, as representative for their Laredo district. Grant, a veteran of 4 years in the Army as transport officer in the India-Burma theater, has been associated with diesel and gas engines for over 14 years. He spent several years in the Orient before the war as export representative for various manufacturers. As Laredo representative for Stewart & Stevenson, he will have charge of sales and service on G.M. diesel engines and Continental Red Seal gas engines for the northern section of Mexico and the Wintergarden section of the Rio Grande Valley of Texas.

Kropp Forge Holds Open House

Some 350 purchasing agents of Illinois, Indiana, and Wisconsin joined in the fun at the Kropp Forge Co. "open house" held early in March at its 20-acre Chicago plant.

Engineered in detail by Preston C. Patch, director of purchases, James E. Sweeney, vice president and general sales manager, and Arthur Anderson, personnel director, the open house gave guests the "low down" on forging operations from raw stocks to finished product.

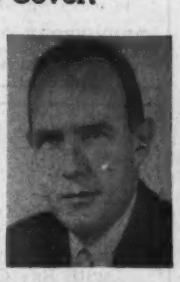
Thirty members of the executive staff, purchasing department, sales department, and personnel department were specially trained to conduct visitors on the plant tour.

American Brake Shoe Names Newbert

Frank B. Newbert has been appointed assistant general purchasing agent for American Brake Shoe Co.

Newbert has been with Brake Shoe since 1934 and has served in various purchasing capacities with the company. A native of Pemberton, N. J., he is a graduate of Rider College in Trenton, N. J.

Ansul Appoints Covert



Ansul Chemical Co., Marinette, Wis., announced recently appointment of Kenneth B. Covert as sales manager of its fire - extinguisher division. Covert joined the Ansul organization in 1945 and has been in charge of refrigerant sales at the company's eastern office in Philadelphia. Before associating himself with Ansul, he was with Macklanburg Supply Co., Oklahoma City, and prior to that he was with Revere Brass & Copper Co., Chicago.

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UNDISPLAYED

All ads, 10 cents a word. Minimum charge, $3.00 per insertion.
Centered Line, any ad, 75 cents.
Box Numbers count 9 words when replies are to be sent to our Tulsa Office. Replies forwarded without charge.

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All classified advertising payable in advance.
10% Discount if 3 insertions are ordered at one time.
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FOR SALE: Wichita Spudder #55; especially strong mast; GAK Waukesha Motor; tools from 20" to 6¼"; various fishing tools. Address Box 245, Mt. Carmel, Illinois.

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1—SA4500 Franks Skid Type Rotary Rig Complete with
1—FXZ 7¼ x 12 Gardner Denver Pump —New Liners—A-1 Condition.
2—HS600 Cummins 200 H.P. Diesel Engines—1 new, 1 overhauled.
1—Set Steel Walkway and pipe racks.
3,900'—New 3½" 13.30# Nat'l Tube Drill Pipe external upset internal flush—Hughes counterbore weld tool joints.
90'—Franks 190,000# portable derrick.
1—5KW Fieldlite Light plant—Dog houses—Tool boxes and everything to make rig complete—ready to run.

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814 Central Bldg., Wichita 2, Kansas
Phone LD-244

EQUIPMENT FOR SALE

FOR SALE: 6200' 24# 7" 2600' 5½" casing all one run. 3200' 2½" upset seamless steel tubing. 803 Tower Petroleum Building, Dallas, Texas. Telephone C-7667.

GEOPHYSICAL drill, can mount on your pickup in a few hours, ideal for core or shot holes to 300'. G. D. mud pump (3½ x 4) with suction hose, 2½" kelly with swivel and high pressure hose, chain pull-down, kelly guides in mast, double drum winch, oil bath rotary and Twin Disc clutches. Built by Republic Supply Co. and is like new. $2750.00. Waters Drilling Service, 69 Beacon Place, Pasadena 8, Calif.

FOR SALE: One 7¾ x 18 Model 15,000 Whelan-Lucey Power Slush Pump as good as new. Melton Supply Co., Box 1360, Seminole, Okla.

FOR SALE—1 Ideco Drilling Machine complete with drilling tools from 5 inch to 10 inch—40 HP Franklin Oil Engine, Steel Mast, all in good condition. H. E. ROBERTS, Box 97, Clare, Michigan, Phone 772.

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5—74,000 Barrel, 115' x 40'
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Available at Once!

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"ANYTHING containing IRON or STEEL"

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RECONDITIONED drilling equipment for deep or shallow wells. Spudders, beams, light rotaries, core drills. Tools, casing, cable. Good used equipment at money-saving prices. Pressey & Son, Pueblo, Colo.

FOR SALE: 79 boxes, 37 pins new 4½" F.H. A.P.I. 6" OD Baash Ross tool joints, $20.00 each, f.o.b. Long Beach. B & B Pipe & Tool Co., 3111 Cherry Ave., Long Beach 7, California.

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